

**Wildland Fire  
Management Plan  
for  
Timpanogos Cave  
National  
Monument**



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# **Timpanogos Cave National Monument Wildland Fire Management Plan**

**2004**

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## **I. INTRODUCTION**

### **A. The Fire Management Plan**

National Park Service (NPS) wildland fire management activities are essential to the protection of human life and property, the protection and management of irreplaceable natural and cultural resources, and to the accomplishment of the NPS mission. The Timpanogos Cave National Monument (TICA) Wildland Fire Management Plan (the Plan) is the primary planning document directing park wildland fire management activities at Timpanogos Cave. These activities include preparedness planning and activities, fire staffing and training, prevention, suppression, and the use of mechanical fuel treatments to achieve management and resource management objectives.

This Plan meets the requirement of Director's Order-18 (DO-18) that all NPS park units with burnable vegetation have a wildland fire management plan approved by the superintendent.

Timpanogos Cave will review and update the fire management plan annually. Annual review is essential to ensure that the Plan continues to conform to current laws, objectives, procedures and strategies. A comprehensive plan revision, and National Environmental Policy Act (NEPA) compliance review, is required every five years. Timpanogos Cave NM will provide a digital copy of each approved Fire Management Plan and all subsequent amendments to the NPS Fire Management Program Center (FMPC), located at the National Interagency Fire Center (NIFC), in Boise, Idaho.

### **B. Collaborative Processes Used to Develop The Plan**

The Timpanogos Cave General Management Plan (1993), Resource Management Plan Draft (1983), and the Fire Management Plan (2004) are all developed with input from neighboring communities, and other NPS program management areas.

The activities covered by the Plan have been given due consideration in balance with other NPS unit management activities.

The superintendent is responsible for assuring policy compliance and the technical and operational soundness of the wildland fire management plan before he or she approves it. Before approving the plan, the superintendent sought the review and advice of Park staff, area and regional staff, and other fire professionals.

### **C. Implementation of Federal Fire Management Policy**

This Fire Management Plan will implement fire management policies and help achieve resource management and fire management goals defined in:

- (1) *Federal Wildland Fire Management Policy and Program Review (1995)*

- (2) Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (USDOI/USDA, 2002)*
- (3) A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10 Year Comprehensive Strategy Implementation Plan (2001)*
- (4) The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide (1998)*
- (5) Managing the Impacts of Wildfires on Communities and The Environment (2002)*
- (6) National Fire Plan (2001)*
- (7) 10-Year Comprehensive Strategy (2001)*
- (8) Implementation Plan, 10-Year Comprehensive Strategy (2001)*
- (9) National Park Service Management Policies (2001)*
- (10) Timpanogos Cave National Monument General Management Plan (1993)*

#### **D. Environmental and Cultural Compliance**

Wildland fire suppression is conducted within Timpanogos Cave National Monument as an emergency action (fire preparedness and suppression actions are generally exempt from the regulatory requirements of the National Environmental Protection Act [NEPA]).

Other elements of this plan associated with wildland fire management (prescribed fire, fuel management, burned area rehabilitation, etc.) are non-emergency actions. These activities are subject to the requirements of NEPA, the National Historic Preservation Act (NHPA) and other applicable regulations.

This plan meets National Environmental Policy Act and National Historical Preservation Act requirements for all activities described in the plan. The FMP incorporated a programmatic approach to the National Environmental Policy Act that covers all activities described in the fire management plan.

Because Timpanogos Cave National Monument staff have chosen a suppression-only policy for the monument, it has been determined that this policy meets the requirements for a categorical exclusion. This categorical exclusion (TICA CE. #1.12) is included in Appendix J.

“Hazardous fuels reduction activities using prescribed fire not to exceed 4,500 acres, and mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing, not to exceed 1,000 acres. Such activities:

- Shall be limited to areas (1) in wildland-urban interface and (2) Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside the wildland urban interface;
- Shall be identified through a collaborative framework as described in “A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan;”
- Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans;
- Shall not be conducted in wilderness areas or impair the suitability of wilderness study areas for preservation of wilderness;
- Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and may include the sale of vegetative material if the primary purpose of the activities is hazardous fuels reduction.”

#### **E. Authorities for Implementation of Fire Management Plan**

The authority for fire management is found in the National Park Service Organic Act (Act of August 25, 1916), which states that the Agency's purpose:

*"... is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."*

This authority was further clarified in the National Parks and Recreation Act of 1978:

*"Congress declares that...these areas, though distinct in character, are united...into one national Park system.... The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."*

Additional statutory authorities are:

- The General Authorities Act of 1970
- Public Law 1640 (Timpanogos Cave Enabling Legislation, 1922)
- The Clean Air Act, Clean Water Act
- The Endangered Species Act
- The Antiquities Act.

## II. RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY

### A. NPS Management Policies as Related to Fire Management

The *National Park Service Management Policies (2001)* is the basic Service-wide policy document of the National Park Service. It is the highest of three levels of guidance documents in the NPS Directives System. *National Park Service Management Policies* is designed to provide NPS management and staff with clear information on NPS policy, required and/or recommended actions, and other information to help them manage parks and programs effectively. Appendix B contains a summary of elements relating to compliance with the 2001 Federal Wildland Management Policy.

It is the policy of the NPS to allow natural processes to occur to the extent practical while meeting park unit management objectives. NPS Management Policies (2001) state that:

"Natural fire is a process that is part of many of the natural systems that are being sustained in parks. Human-ignited fires often cause the unnatural destruction of park natural resources. Wildland fire may contribute to or hinder the achievement of park management objectives. Therefore, park fire management programs will be designed to meet park resource management objectives while ensuring that firefighter and public safety are not compromised.

Each park with vegetation capable of burning will prepare a fire management plan and will address the need for adequate funding and staffing to support its fire management program. The plan will be designed to guide a program that responds to the park's natural and cultural resource objectives; provides for safety considerations for park visitors, employees, neighbors, and developed facilities; and addresses potential impacts to public and private property adjacent to the park. Preparation of the plan will include collaboration with adjacent communities, interest groups, state and federal agencies, and tribal governments. (NPS Management Policies, Chapter 4.5)

National Park Service Management Policies (USDI 1988) define natural resource management as the concept of perpetuating a total natural environment or ecosystem, as compared with the protection of individual features or species. This concept is a distinguishing feature of the service's management of natural lands. Accordingly, the primary goals outlined in NPS Resource Management Plan's are the preservation of natural and cultural resources.

All fires burning in natural or landscaped vegetation in parks will be classified as either wildland fires or prescribed fires. All wildland fires will be effectively managed through application of the appropriate strategic and tactical management options. These options will be selected after comprehensive consideration of the resource values to be protected, firefighter and public safety, and costs. Prescribed fires are those fires ignited by park managers to achieve resource management and fuel treatment objectives. Prescribed fire activities will include monitoring programs that record fire

behavior, smoke behavior, fire decisions, and fire effects to provide information on whether specific objectives are met. All parks will use a systematic decision-making process to determine the most appropriate management strategies for all unplanned ignitions, and for any prescribed fires that are no longer meeting resource management objectives.”

The second level of NPS guidance documents (under *NPS Management Policies*) are Director’s Orders. Director’s Orders provide operational policies and procedures that support and supplement Management Policies. Director’s Orders are often further supported with a third level of guidance consisting of reference manuals or handbooks. Specific guidance to the NPS on wildland fire is contained in Directors Orders (DO-18) and attendant Reference Manual (RM-18), and “The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide” (1998).

*Director’s Order 18 – Wildland Fire Management* and *Reference Manual 18 – Wildland Fire Management* are the documents that provide National Park Service units with specific guidance on the preparation of wildland fire management plans and on wildland fire and prescribed fire management. DO-18 states:

*Wildland fire may contribute to or hinder the achievement of park management objectives. Therefore, park fire management programs will be designed to meet resource management objectives prescribed for the various areas of the park and to ensure that firefighter and public safety are not compromised. Each park with vegetation capable of burning will prepare a fire management plan to guide a fire management program that is responsive to the park’s natural and cultural resource objectives and to safety considerations for park visitors, employees, and developed facilities.*

*The NPS is committed to protecting park resources and natural ecological processes; but firefighter and public safety must be first priority in all fire management activities.*

RM-18 states that the paramount considerations of each park fire management program will be:

1. Protection of life, both employee and public
2. Protection of facilities and cultural resources
3. Perpetuation of natural resources and their associated processes
4. Perpetuation of cultural and historic scenes.

These priorities are further emphasized in RM-18 (chapter 3, page 1) with the following language:

*Safety is the responsibility of everyone assigned to a wildland or prescribed fire incident. The safety of employees and visitors alike must be of prime concern during fires. Agency administrators at all levels need to stress that firefighter and visitor safety always takes precedence over property and resource loss.*

## **B. Enabling Legislation and Purpose**

Timpanogos Cave National Monument was established October 14, 1922 (42 STAT 2285) when President Harding signed a proclamation creating the monument under the 1906 Antiquities Act. The proclamation and General Management Plan direct the park to preserve and protect the unusual scientific interest of the cave.

"Whereas, a natural cave, known as Timpanogos Cave, which is situated upon unsurveyed lands within the Wasatch National Forest in the State of Utah, is of unusual scientific interest and importance, and it appears that the public interest will be promoted by reserving this cave with as much land as may be necessary for the proper protection thereof, as a National Monument."

## **C. Land Management Planning**

Timpanogos Cave National Monument was established by Presidential Proclamation No. 1640, signed by President Warren G. Harding on October 14, 1922. The Proclamation reserved Timpanogos Cave and "as much land as may be necessary for the proper protection" of the cave because the cave "is of unusual scientific interest and importance" and the "proper protection" of the cave serves the "public interests". At the time of the Proclamation, Timpanogos Cave was within the Wasatch National Forest managed by the U.S. Forest Service. The Proclamation further states that the reservation of land for the National Monument was "not intended to prevent the use of the lands for National Forest purposes under the proclamation establishing the Wasatch National Forest, and the two reservations shall both be effective on the land withdrawn but the National Monument . . . shall be the dominant reservation".

By Executive Order No. 6166, dated June 10, 1933, all National Monuments were placed under the jurisdiction of the Department of the Interior. On July 1, 1934 Timpanogos Cave National Monument was transferred to the National Park Service. In so doing, the 250 acres of land within Timpanogos Cave National Monument fell under the provisions of the National Park Service Organic Act of 1916. The Organic Act requires that national park units be managed in a manner that will conserve the natural and cultural resources and provide the public use and enjoyment. The Organic Act provides additional purpose to Timpanogos Cave National Monument but the Proclamation of 1922 remains the dominant purpose of the monument reservation.

## **MISSION**

The mission of the National Park Service at Timpanogos Cave National Monument is derived from the Proclamation described above, the National Park Service Organic Act and succeeding legislation, and from significance statements developed for the monument that describe the national park values to be preserved. The mission for Timpanogos Cave National Monument is consistent with, and more specific than, the mission of the National Park Service stated in the National Park Service Strategic Plan. The Mission of the National Park Service

*The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.*

## **Purpose of Timpanogos Cave National Monument**

Protect the Timpanogos Cave system to assure preservation of national resources of scientific interest and importance in such manner as serves the public interest.

Conserve the natural and cultural resources of the monument, inclusive of the cave system, and provide for the public use and enjoyment of the resources by this and future generations.

## **D. Resource Management Planning**

Timpanogos Cave currently has a draft Resource Management Plan which was written in 1983. Like the GMP, the Resource Management Plan makes no direct references to fire or fire suppression. It does place a strong emphasis on protection of the natural and cultural resources. The NPS is in the final stages of developing a new resource activity management software system called RAMS. RAMS will assist parks in tracking park resource management from planning stages through the budget process, through work and compliance scheduling, execution and performance to accomplishments. It is a joint effort between Cultural Resources and Natural Resources directorates designed for parks to provide full accountability for park resource management.

## **E. Meeting GMP and RMP Goals Through the Plan**

Implementation of the Timpanogos Cave National Monument Fire Management Plan will help meet the objectives of the General Management Plan and draft Resource Management Plan by:

- Contributing to the preservation and rehabilitation of historic landscapes
- Protecting historic, cultural, and natural resources

- Ensuring human health and safety throughout fire management programs and activities

The Fire Management Plan is a detailed program of action to implement fire management policies and objectives.

### **III. WILDLAND FIRE MANAGEMENT STRATEGIES**

All fires that are not ignited by park managers for specific purposes are defined as wildland fires. All wildland fires will receive management actions appropriate to the safety of firefighters and the public, the resources and values to be protected, the condition of fuels, current and predicted fire behavior, weather, and topography to accomplish the specific objectives for that individual fire. These management actions, termed “appropriate management responses,” will vary from fire to fire and may vary within an individual fire.

Timpanogos Cave National Monument is a 250-acre monument located in the high-use American Fork canyon. Because of the number of historic structures, the cultural values at risk are high, and in association with the heavy use of the area, the most realistic wildland fire management strategy is suppression. Mechanical reduction of fuel will be used in conjunction with fire suppression. Fire use as a management tool is not being considered at this time.

Prescribed fire use has not occurred at Timpanogos Cave National Monument since its establishment in 1922, and no prescribed fire is currently planned. There are several reasons why prescribed fire is not a viable option. First, there is a high concentration of structures: historic, residential, concessions, visitor facilities, and operational facilities. Next, there is a high concentration of use: picnic area, visitor center, visitor center parking, and the Timpanogos Cave Trail. Finally, the terrain is unsuitable to manage prescribed fires: vertical, steep canyon walls, rugged and dangerous rock slopes for travel, and the high-use cave trail through the terrain. Although not planned it is possible that cross-boundary projects involving a portion of the Monument away from all facilities could be developed in conjunction with the Uinta National Forest. Compliance documents for prescribed fire or mechanical fuel treatments will be completed on a project basis as needed. Any proposed prescribed fires will go through the NHPA, section 106 compliance process prior to implementation.

Timpanogos Cave is near the mouth of American Fork Canyon and operates an interagency fee booth with the Forest Service. The Canyon is a major recreation area and is expected to remain a suppression area except in its upper reaches. The Uinta National Forest Service is beginning to study its watersheds for fire use and is considering wilderness fire where it can be safely implemented. The Uinta National Forest is implementing mechanical fuels management in the road corridor along the American Fork River.

## **A. General Management Considerations**

The primary goals of the wildland fire management program at Timpanogos Cave are to protect human health and safety, protect property, enhance community protection, diminish risk and consequences of severe wildland fires, and to the extent possible, increase health of the ecosystem.

To accomplish these goals, wildland fires at Timpanogos Cave will normally be managed through suppression strategies. Fire managers will balance the potential impacts of wildland fire with the potential impacts of fire suppression activities in choosing the appropriate management response.

Important values to be protected at Timpanogos Cave National Monument include: the Timpanogos Cave System and Cave Trail. These include the cultural landscapes (and the natural resources of which they are composed) and historic structures associated with the Monument. Values to be protected also include natural resources and processes, natural levels of biodiversity, and archeological resources.

Values to be protected and their susceptibility to damage or loss by fire are discussed in more depth in the description of the Fire Management Unit (section III.A. of this plan).

Preplanned decisions based on historical fire behavior indices will be considered in selecting appropriate management responses for suppression. The Monument will not use wildland fire as a tool to benefit resources. The Monument's use of wildland fire is prohibited by the lack of fire management staff, the small size of the monument, the adjacent wildland/urban interface and the insignificant role that fire has historically had in the monument's natural resources.

Wildland fires at Timpanogos Cave are managed with the support of local community fire departments. This community-based approach to wildland fire management involves partnership, cooperation and collaboration between the Alpine/Highland Volunteer Fire Department, the U.S. Forest Service, and Timpanogos Cave National Monument.

Additional fire planning support and collaboration is provided by the Fire Management Officer (Area FMO) located at Zion National Park. The Area FMO provides technical assistance to the Monument on all fire management matters, including fire management programs such as the Weather Information Management System (WIMS), the NPS Wildland Fire Computer System, the National Fire Danger Rating System (NFDRS), the resource ordering system (ROSS), the Incident Qualification and Certification System (IQCS), Fire Program Analysis (FPA), and FIREPRO budgeting. The Area FMO also assists with the Monument's wildland fire qualification and certification program, coordination of fire training and mobilizations, development of cooperative agreements

with local and state agencies, administration of Rural Fire Assistance Program grants to local fire departments, and developing fire prevention, preparedness, and suppression operational plans.

The Monument, in accordance with NPS policy, uses Minimum Impact Suppression Tactics (MIST) in all fire management activities. MIST is defined as the application of techniques that effectively accomplish wildland fire management objectives while minimizing the impacts to cultural and natural resources commensurate with ensuring public and firefighter safety and effective wildland fire control. Examples of MIST include using existing natural or constructed barriers to contain wildland fires, mowing firebreaks in grassland, and using pumps and hoses to apply water to suppress fire activity and reduce fire spread.

## **B. Wildland Fire Management Goals**

**Goal 1:** Make firefighter and public safety the highest priority of every fire management activity.

**Objective:** Ensure all wildland fire operations cause no injuries to members of the public or firefighters.

### **Strategies:**

- All personnel involved in fire management operations will receive a safety briefing describing known hazards and mitigating actions, current fire season conditions and current and predicted fire weather and behavior.
- Fire management operations will be carried out by qualified individuals that promote the safe and skillful application of fire management strategies and techniques.
- Timpanogos Cave National Monument neighbors, TICA visitors and the local residents will be notified of fire management activities that have the potential to impact them.
- All or portions of TICA will be closed to the public when fire activity poses a threat to human safety (at the discretion of the Superintendent).
- Maintain a proactive fire organization that effectively responds to changing fire conditions, coordinates with local cooperators, and assists the Eastern Great Basin Zone.
- Manage all wildland fire incidents in the most cost-effective manner possible commensurate with values at risk.

**Goal 2:** Manage wildland fires in concert with federal, state and local air quality regulations.

**Objective:** Timpanogos Cave National Monument is a suppression park and all fires will be suppressed when safe to do so. Should some circumstance determine that a portion of the monument away from all facilities be considered for a prescribed fire in conjunction with fire management of the Uinta National Forest, the monument will

ensure air quality thresholds for National Ambient Air Quality Standards are not exceeded in adjacent air-sheds (any area outside of TICA) due to prescribed fire activities.

**Strategies:**

- Impacts to air quality will be considered as part of Timpanogos Cave National Monument's decision not to implement any prescribed fire projects.
- Fire suppression will be the most effective means to minimize impacts to air quality.
- Air quality impacts will be addressed as a part of the alternative development and selection in the Wildland Fire Situation Analysis (WFSA).
- Smoke impact mitigation measures will be developed and implemented for all prescribed fire actions.

**Goal 3:** Use the Appropriate Management Response (AMR) to suppress fire and prevent spread onto adjacent private property, while protecting the natural, cultural, and historic resources of TICA.

**Objective:**

- Contain 99% of all wildland fires to a size of 20 acres or less.
- Manage suppression actions so that rehabilitation costs are less than 10% of suppression costs.

**Strategies:**

- Prioritize suppression actions on fires or portions of fires that threaten to damage public property.
- Assure safe, rapid response to wildland fires with trained and qualified personnel and equipment.
- Complete annual and regular preparedness reviews to assure program readiness.
- Ensure TICA staff responsible for fire operations understands wildland fire standards, guidelines and policy.
- Maintain an effective fire prevention program that eliminates human-caused fires and minimizes threats to life and property.
- Manage all wildland fire incidents in the most cost-effective manner possible commensurate with values at risk.
- Ensure wildland fire suppression operations employ Minimum Impact Suppression Tactics.
- Ensure fire operations personnel are briefed on TICA resources and potential damage from fire and suppression actions.
- Ensure park staff members are assigned as resource advisor(s) to wildland fires within TICA.
- Monitor, evaluate and report on the effects of fire on TICA resources.

**Goal 4:** Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with cooperator fire

management entities within and outside the Eastern Great Basin.

**Objective:** Annually review and modify as necessary agreements with the agencies listed below and participate in annual meetings between cooperators within the Eastern Great Basin

**Strategies:**

- Ensure cooperative agreements are current and operational.
- Coordinate agreements or operating plans with the following entities:
  1. Northern Utah Interagency Fire Center,
  2. Surrounding cities of American Fork, Highland, and Alpine,
  3. National Forest Service-Pleasant Grove Ranger District

**Goal 5:** Reduce wildland fire hazard around developed areas and adjacent to cultural and historic sites.

**Objective:** Ensure protection of administrative structures, cultural, and historic sites from unwanted wildland fire.

**Strategies:**

- Apply defensible space and FIREWISE standards in suppression areas to reduce fire intensity and severity to lesser levels.
- Apply mechanical hazard fuel reduction around those cultural and historic sites vulnerable to unwanted wildland fire.

The Timpanogos Cave fire management program goals reflect Federal fire policy, the core principles and goals of the *Comprehensive Strategy*, and *Cohesive Strategy* where supported by land and resource management plans.

Timpanogos Cave's wildland fire management goals contribute to accomplishing the *National Park Service 10-year Comprehensive Fire Strategy (NPS, 2000)*. This strategy outlines goals and actions in four fire management program areas: oversight and accountability, wildland fire preparedness, wildland fire operations, and fire protection capabilities of rural fire districts.

### **C. Wildland Fire Management Considerations**

The following wildland fire management options are available for use at Timpanogos Cave National Monument:

**1. Wildland Fire Suppression:** Historically, all wildland fires have been suppressed at Timpanogos Cave. Under this plan, the Monument will continue to suppress all wildland fires using the most appropriate management action. Determination of the most appropriate management action will consider human safety, threat and potential damage to property, resources, and cost effectiveness. Suppression may not be used to accomplish resource objectives.

**Prescribed Fire:** Though a program of using prescribed fire at Timpanogos Cave is not considered in this Plan, individual burns may be used as a fire fighting tool for protection of cultural resources, especially historic scene restoration and maintenance, hazard fuel reduction, and natural resource objectives. If a determination is made that a specific prescribed fire is required, that prescribed fire will be subject to the requirements of NEPA, the NHPA and other applicable regulations.

Fire will not be used to dispose of natural vegetative debris deemed infeasible or impractical to remove mechanically within the monument in a non-wildland fuel environment (parking lot, storage yard, gravel pit, snow-covered area, etc.) due to a lack of a suitable location. This debris generated from routine maintenance activities, construction activities, removal of hazard trees, discarded building, and administrative materials will be hauled from the monument and disposed of at the Utah County landfill or other approved location. Debris burned in a non-wildland environment does not require a prescribed fire burn plan. Debris burned in a wildland environment (including on snow covered ground) requires a prescribed fire burn plan. Any material being burned for debris disposal must be classified as permissible to burn under applicable Federal, State, Tribal, and Local regulations.

The Monument will follow all applicable guidance and regulations when using fire for debris disposal. NPS guidance on debris burning is found in RM-18.

**3. Wildland Fire Use:** Wildland fire use will not be used at Timpanogos Cave. This option was rejected due to the small size of the Park, the significant degree of wildland urban interface along the Monument boundary, and the lack of available qualified fire personnel required to manage these fires.

**4. Non-Fire Applications:** The reduction or removal of fuels by mechanical means is an option that may be used for objectives such as protection of resources, historic scene restoration and maintenance, protection of private property located in the wildland/urban interface, invasive species control, or other natural resource objectives.

#### **D. Description of Wildland Fire Management Unit (FMU) and Management Strategies to be implemented**

A fire management unit is any land management area definable by objectives, management constraints, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regime groups, etc., that sets it apart from management characteristics of an adjacent unit. The land of Timpanogos Cave NM covers 250 acres.

Timpanogos Cave National Monument is composed of one Fire Management Unit. The FMU is designated with a suppression response for all natural and human-caused ignitions. Goals, objectives and strategies for the FMU are described above in Section III, Wildland Fire Management Strategies.

Aggressive attack will be made to suppress all wildland fires at their minimum size using Appropriate Management Response (AMR). Fires within the Monument could spread

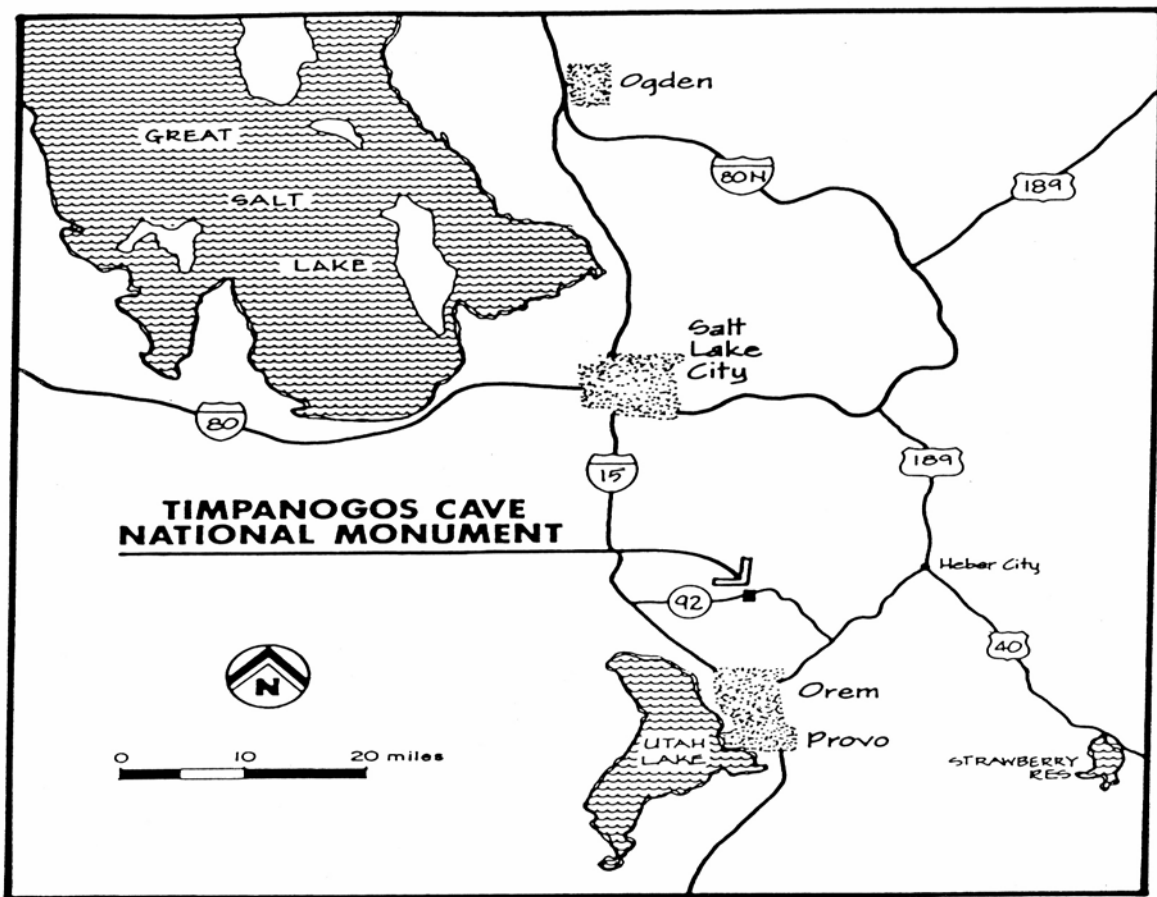
quickly if crowning occurs in the conifers. Rapid up-slope spread would endanger the cave trail and cave system areas. However, rock cliffs and outcroppings as well as talus slopes on both sides of the American Fork Canyon are potential barriers to fire spread. American Fork River and State Highway 92 at the bottom of the canyon may limit fire spreading from one side of the canyon to the other.

The 1993 GMP states to remove visitor use facilities and potentially park offices and residences from American Fork Canyon. This will decrease structure protection needs, but will not in itself increase the fire safety on the trail. It may, in fact, make public contact and notification of an evacuation more difficult.

**FMU Description:**

Timpanogos Cave National Monument, 250 acres in size, is located 35 miles south of Salt Lake City, Utah. Surrounded by the Uinta National Forest, the Monument is situated in a narrow, steep, and rugged canyon. The American Fork River runs through the Monument, a quiet brook in winter, a raging torrent when full of snow melt. (**Figure 1**)

**Figure 1. Timpanogos Cave National Monument located within Utah**





## a. FMU Characteristics

### Waterways and Wetlands

The major hydrologic feature is the American Fork River, which descends from a series of reservoirs, enters the park near the northeast corner, and exits to the west. The flow rate peaks in June. Several small ephemeral streams originate in the steep canyons above the river. The cave system is drained by some of these tributaries. A concern exists for the possible effects of a wildland fire on the cave and cave watershed.

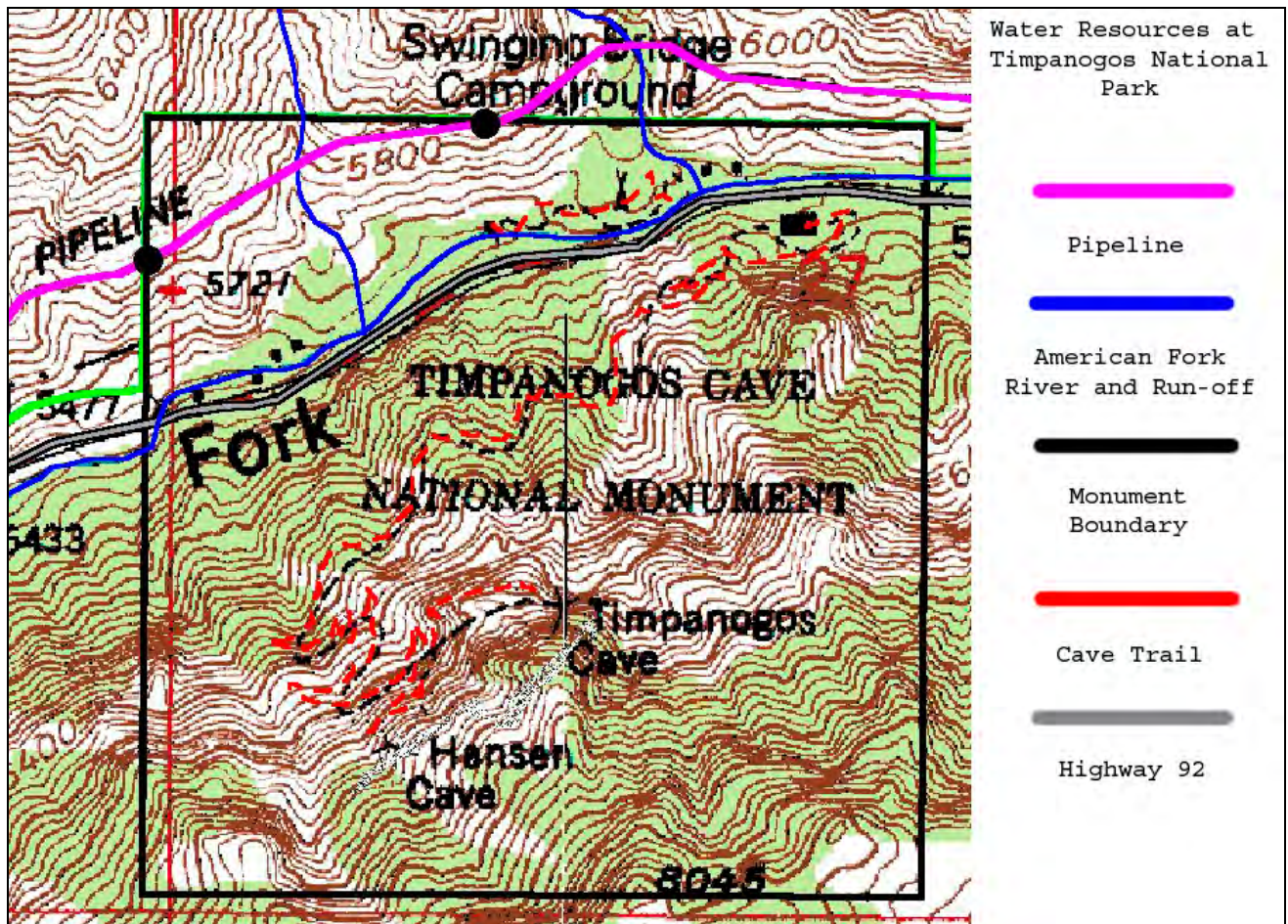


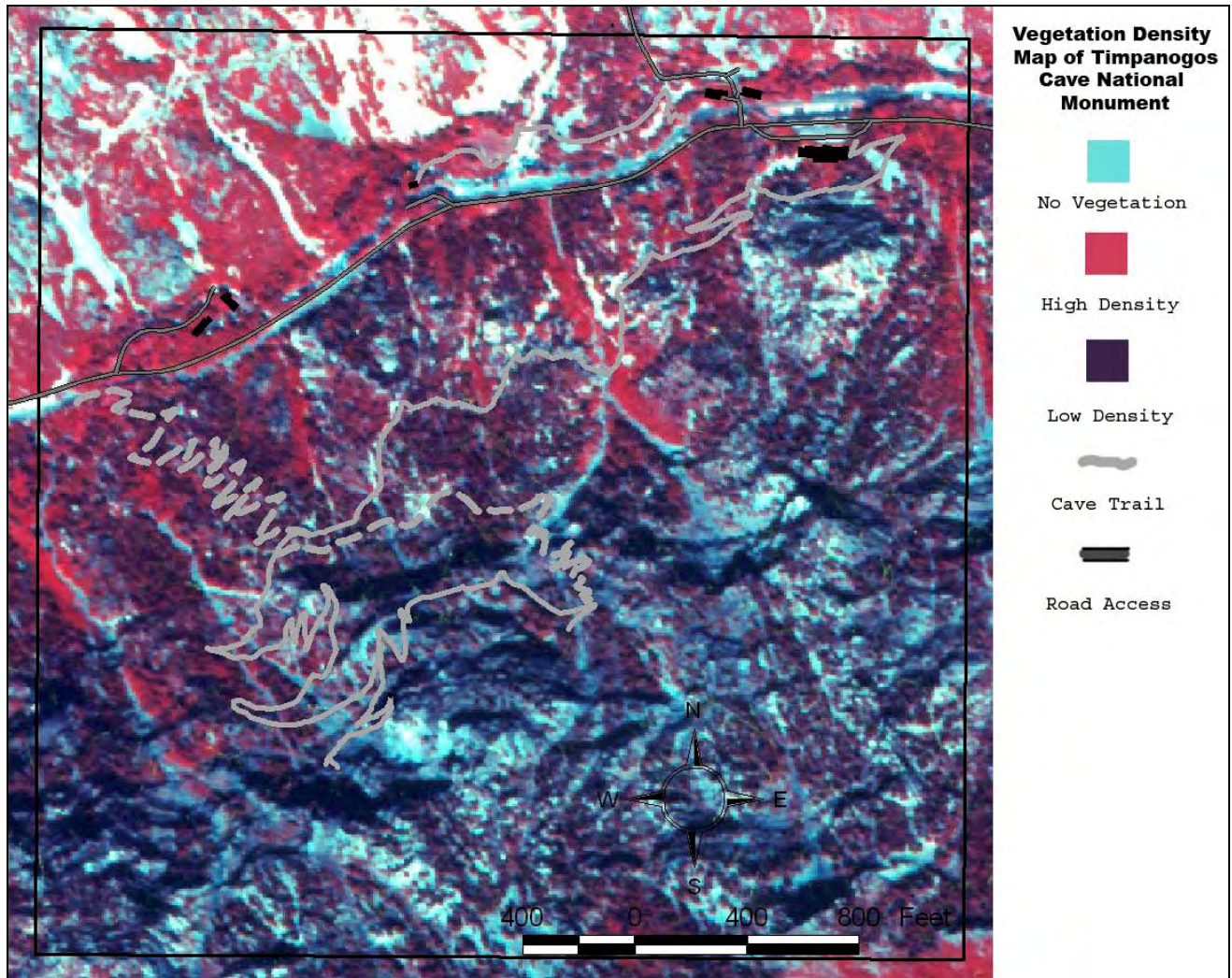
Figure 3. Timpanogos Cave National Monument Water Resources.

### Vegetation

Vegetation varies as a result of the diverse elevations and aspects at Timpanogos Cave National Monument. (Figure 4) Three distinct plant communities exist. (1) Gambel oak dominates on warm, dry south and west-

facing slopes. Rocky Mountain juniper, hackberry, narrow and broadleaf mountain mahogany, squaw bush, sagebrush, and cliff rose also occur. (2) The canyon floor provides a moist environment suitable for large trees such as cottonwood, box elder, and white fir mixed with chokeberry, Utah juniper, Oregon grape, and Red Osier dogwood. (3) The moist, shaded environment of north-facing slopes supports white fir, Douglas fir, Red Osier dogwood, big tooth and mountain maple, elderberry, jamesia, dwarf juniper, and a variety of other plants. **(Appendix C)**

Historic records show that Timber was cut from much of the monument and American Fork Canyon from the 1850s to the 1920s to support mining operations, saw mills, and the growing population's lumber and fuel wood needs. No specific data on volume or limits of the timber cutting are available, but it is certain that most of the lower slopes of the monument is second growth forest.



**Figure 4. Vegetation Density within the Boundaries of Timpanogos Cave National Monument**

### **Soils and Topography**

Timpanogos Cave National Monument is located in the American Fork Canyon of the Wasatch Mountains, a narrow, fault uplifted range extending nearly due north from central Utah into southern Idaho. The canyon runs basically east/west and drains westward into Utah Valley. The majority of the Monument is situated on the southern wall above 5,665 feet.

The cave system is on the south wall of the canyon at 6,730 feet elevation. The cave system consists of three caves (Hansen, Middle, and Timpanogos) connected by human-made tunnels. The total distance through the caves is approximately 2,300 feet.

Soils are mostly thin and rocky on the slopes and deep in the canyon floor. A detailed soils map of the area does not exist.

### **Wildlife**

Riparian woodland, rocky cliffs, talus slopes, springs and streams provide diverse habitats for wildlife in Timpanogos Cave National Monument. Common animals include mule deer, elk, mountain lion, ringtail, skunks, raccoons, chipmunks, mice, and several species of ground squirrels. Several bird species are common, including wrens, thrashers, kinglets, waxwings, vireos, and wood warblers. Fish of the American Fork River include brown trout and rainbow trout. Reptiles include several species of snakes and lizards. **(Appendix C)**

### **Air Quality**

Utah County, in which the park is located, has frequent air quality problems related emissions from industry and vehicles, and nearby population centers. Prevailing winds push air pollution from the valley population centers up against the Wasatch Range. This traps pollutants and greatly slows their dispersion. The U.S. Forest Service has an air quality station inside the monument and a photo station just north of it. The park is generally above the pollution layer, and is east of the population centers. Smoke from a wildland fire limited to small acreage of the monument would most commonly spread eastward away from the main population center, but could have some minor affect on the air quality in the Heber Valley.

### **Archeological Resources**

An archaeological survey has been completed at TICA according to Executive Order 11593. The one site was found. The Fremont-style rock art does not meet the criteria for nomination to the National Register of Historic Places. The location is near a structure and therefore will be protected from fire along with the structure.

A List of Classified Structures Inventory was carried out in November 1975. A national Register nomination for the Timpanogos Cave Historical District was placed on the Register in 1982 and includes: Residence #8, Bridge, Comfort Station Building #126 (bath house), Comfort Station Building 127 (cave area restrooms), two cold cellars, the stone storage building, and the Timpanogos Cave Trail. All of these structures except the Cave trail and Comfort Station #127 are located in the park residential and maintenance area. **(Appendix E)**

### **Structures**

There are ten buildings within the Monument. Three buildings provide the majority of support for Monument operations. The visitor center provides cave tour ticket sales, interpretation and information services, book sales, restrooms and other visitor services. Appurtenant to the visitor center is a concession operation with food and souvenir sales. The maintenance shop houses all maintenance operations, equipment and offices. A historic rockhouse is being used for Science and Resource Management offices, Interpretative workspace.

The Monument has an historic district that includes the canyon bottom from the original superintendent's house to the West Side of the monument boundary and the mostly abandoned historic trail to the cave. The historic district contains seven buildings or sites.

There are two houses in the monument. The two houses are occupied and maintained by monument staff.

The trail to the caves originates at the visitor center and climbs 1,067 feet over one and one-half miles. The trail through the caves and return trail from the cave exit to the main trail is an additional half-mile. Along this route are benches, trash containers, tunnels, catwalks, lighting system, doors, security gate, employee restrooms, and other miscellaneous infrastructure.

The Swinging Bridge Picnic area has 21 sites with picnic tables, grills, fire rings, trash containers, and water spigots. The picnic area also has restrooms, paved trails and two bridges across the American Fork River. The picnic area is the downstream end of the Canyon Nature Trail that is one-quarter mile long with the upstream end being near the visitor center. An additional small picnic area with two sites is located near the visitor center.

Other infrastructure includes short road segments (the highway through the Monument is a State highway and maintained by Utah Department of Transportation), two road-bridges across the American Fork River, parking areas, signs, thousands of feet of rock retaining wall, and water and wastewater systems.

## **b. FMU Goals**

The entire Monument is designated as a single fire management unit (FMU) with a single set of management goals and objectives applying to the entire Park. These goals and objectives are listed below:

**Goal 1.** Maintain firefighter and public safety. Firefighter and public safety is the highest priority of every fire management activity.

*Objective: 100 percent of wildland fire operations are conducted so that they cause no injuries to the public and no serious injuries to firefighters.*

**Goal 2.** Suppress unwanted and undesirable wildland fires regardless of ignition source to protect public health and safety, real property, and the natural, cultural, and historic resources of the Park.

*Objective: 100 percent of wildland fires are controlled within 24 hours and limit wildland fires to less than 5 acres.*

*Objective: Protection of Park resources is actively considered in 100 percent of all wildland fire planning and fire management activities.*

*Objective: Consideration of resource protection will be described in 100 percent of all wildland fire planning and management documents (FMP, WFIP WFSa, BAER Plan, etc.).*

*Objective: 100 percent of all wildland fire suppression actions will be managed so that rehabilitation costs are less than 25% of suppression costs.*

**Goal 3.** Manage wildland fires in concert with federal, state, and local air quality regulations.

*Objective: 100 percent of all wildland fires and debris burning will be conducted consistent with all Federal, State, and local smoke management regulations.*

**Goal 4.** Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire management entities.

*Objective: Cooperative agreements will be developed and maintained with all appropriate local, regional, and national fire management organizations.*

*Objective: All cooperative agreements will be reviewed annually to ensure that they are consistent with management and resource management goals.*

**Goal 5:** Reduce wildland fire hazard around developed areas and areas adjacent to cultural and historic sites.

*Objective: 100 percent of known hazardous fuel accumulation that could contribute to the damage of primary Monument resources or the properties of neighboring landowners will be reduced by mechanical treatment.*

**Goal 6.** Educate employees and the public about the scope and effects of wildland fire and wildland fire management.

*Objective: All Timpanogos Cave employees will be able to provide basic fire information to visitors or direct them to a Monument employee who is able to provide it.*

*Objective: All Monument staff with fire management responsibilities will receive sufficient training to bring them to the appropriate level of knowledge, skill, and certification and to maintain that certification.*

*Objective: When fire danger is very high or extreme, Monument staff will contact at least 70% of Park visitors with a fire prevention message through signage, handouts, interpretive activities, or personal contact*

### **c. Management Considerations**

These constraints, considerations, or decision criteria will influence all fire management activities within the fire management unit.

#### **(1) Health and safety**

All fire management actions will have firefighter and public safety as it's top priority. All Park firefighters will adhere to applicable NPS policy relating the training, certification, and performance of NPS wildland firefighters.

#### **(2) No unacceptable impacts to cultural resources.**

All appropriate steps necessary to protect the Park's cultural resources will be taken as long as those steps do not endanger firefighter and public safety.

#### **(3) Ensure socio-political economic impacts, including those involving the wildland urban interface (WUI), are considered in developing implementation plans.**

The effects of any fire management activity on the neighboring communities, with emphasis on the wildland/urban interface component of those communities will be considered during planning and implementation of those activities.

(4) Ensure that the public, organizations, and cooperating agencies are aware of any fire management operation that may have an impact on them.

To ensure good relations with Park neighbors, local organizations and governments, cooperating agencies and the public, every effort will be made to keep these parties informed about significant fire management actions that might impact them or their interests.

#### **d. Historic Role of Fire**

Fire helped create a vegetative mosaic within the Uinta National Forest, but its role within Timpanogos Cave National Monument is uncertain. Park records are limited due to a structure fire at the visitor center in 1991, but there are no known wildland fires in the Monument since 1975. This has been verified through a search of National Forest and Regional fire records, and interviewing long-time park personnel.

Timpanogos Cave NM employees have assisted the Uinta National Forest, which surrounds the Monument, on ten fires of record. Of these, nine started in August or September, and one in July. Seven of the ten were human-caused, the other three by lightning.

#### **e. Wildland Fire Management Situation**

##### **1. Historic Weather Analysis**

TICA climate is temperate, with summer highs at headquarters in the canyon bottom normally in the upper 80s. Record high temperatures over 100 degrees F have been recorded in June, July and August. Winter lows are normally near 20 degrees F, with recorded extremes of -12 and -10. Average snowfall is 103 inches. Snow melts quickly on south-facing slopes, but accumulates through winter on the shaded north slopes and on the canyon floor. Snow and ice are normally found at the cave elevation from early November to May.

Average annual precipitation is 25.6 inches. Although summer thunderstorms have brought record amounts of rain, June, July, and August are normally the driest months. Down drafts from thunderstorms and intense lightning storms are common. Because of the dense forest cover with a closed canopy, high winds at the bottom of American Fork Canyon are rare. In the summer, however, diurnal canyon winds over 30 mph may occur.

**Table 1. Timpanogos Cave National Monument Monthly Climate Summary; March – October.**

<b>Timpanogos Cave, UT (242275)</b> <b>Monthly Climate Summary</b> <b>Period of Record 4/1/1971 – 10/31/2000</b>								
	March	April	May	June	July	August	Sept.	Oct.
Avg. Max. Temp (F)	50.5	60.5	70.8	82.4	91	90.1	78.6	62
Avg. Min. Temp (F)	28.6	34.2	41.7	49.7	56	55.6	47.5	38
Avg. Total PPT (in.)	.86	.75	.95	.51	.34	.47	.71	.68

Weather at Timpanogos Cave National Monument greatly varies throughout the seasons. In winter, the canyon is often covered in a blanket of white snow. Temperatures can be very cold nearing 0° F (-18° C). In spring the temperature warms up allowing the snow to melt and it begins to rain significantly more. Summer can be very hot reaching temperatures of over 100° F (38° C). Humidity and moisture during the summer are very low. Isolated summer mountain thunderstorm cells travel through rapidly bringing sometimes intense lightning activity associated with anywhere from zero rainfall to heavy, brief rains. Thunderstorm activity usually ends by early September. During fall, the temperature cools considerably and begins to occasionally rain. The Visitor Center has an average of 90 inches of snow a year and 25 inches of rain a year. The typical wildland fire weather pattern doesn't begin until mid-July with the arrival of warm temperatures. However, Utah has been in a severe drought for the last six years which drastically increases the fire potential above these historical records.

## **2. Fire Season**

The fire season at TICA begins after spring snow melt, usually in early May. The season ends with the first measurable snowfall, usually in late October. Fires in the surrounding Uinta National Forest are most common in the last half of the summer when high temperatures, low humidity, and increased human and lightning activity are present in combination

## **3. Fuel Characteristics**

Timpanogos Cave National Monument is comprised of the following fuel types: Riparian, Gambel Oak, and Douglas Fir/mixed conifer:

- a. Riparian (Fire Behavior Fuel Model 8 and 9) - The area is usually wet, dominated by cottonwoods, maples, and sedges with short needle conifers a small component. These areas frequently are fire breaks, although in dry conditions they can burn with moderate intensity. Most deciduous species re-sprout after fire, an infrequent disturbance in this area.
- b. Gambel Oak (NFFL Fuel Model 4 or 6) - Depending on the site and stand, Gambel oak may be a small tree, a dense shrub thicket, a shrub clump, or a low shrub under

the over story. It is found on dry and south facing slopes. While individual stems have no adaptations for fire survival, clones with long, freely branched rhizomes re-sprout vigorously after fires. Gambel oak tends either not to burn or to burn as a crown fire. Multiple fatality fires have occurred in Gambel oak, including the 1994 South Canyon fire in Colorado and the 1991 Wasatch Mountain fire near Alpine, Utah, which trapped a dozer operator and a county sheriff in an uphill run. Live fuel moisture content is critical. Usually it will not burn if moisture content is above 150%; below 100% it burns readily. Typically this produces spring fires prior to green-up and fall fires, but not summer fires. In dry years, foliar moisture may be under 150% by mid-July, and oak will burn in intense, upslope runs that are beyond the capability of suppression resources to safely control.

- c. Douglas fir/mixed conifer (NFFL Fuel Model 10) - The Douglas fir/mixed conifer forests are on North facing slopes. Low to moderate surface fires are expected, with possible torching, spotting, and running crown fire in dry conditions.

## **IV. WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS**

### **A. General Implementation Procedures**

Implementation of the components of the wildland fire management program at Timpanogos Cave NM is consistent with the park's fire management capabilities and will consider the current and predicted conditions affecting fire behavior. When possible, preplanned decisions, based on historical fire behavior indices will be considered in *Stage I Wildland Fire Implementation Plan* development to select an appropriate management response.

A Wildland Fire Implementation Plan (WFIP) will be initiated for all wildland fires. This plan will provide the framework for determining the appropriate management response. The WFIP Stage I: Initial Fire Assessment will be the responsibility of the Incident Commander or Timpanogos Cave's Park Fire Coordinator. Since the Fire Management Plan requires suppression of all wildland fires, the requirement for a decision checklist as a part of the Stage I analysis can be considered met. Subsequently, Stage I analysis may be satisfied at the programmatic level in the Fire Management Plan through determinations made by combinations of values to be protected and/or fire behavior thresholds. A copy of the WFIP Stage I form can be found in Appendix G.

### **B. Wildland Fire Suppression**

#### **1. Range of Potential Fire Behavior**

TICA is comprised of three main fuel models. Riparian exists sparsely throughout the park, mostly in drainages. Gambel Oak lies on south facing slopes and in patches throughout the park. Douglas fir/mixed conifer with dead component lies within the bottom land bordering the American Fork River, and also in drainages. The most

extreme fire behavior would occur in the heavy wooded areas in small patches dotting the mountain. Expect high rates of spread through these areas with intensities in the moderate range (30+ft. flame lengths). In the areas with fuel model 6 that have a high dead component, in extremely dry years, these areas could produce high fire intensities and spread rates, especially pushed by high wind. Even under normal burning conditions, these areas may be a problem in controlling a fire because of the steep slopes and rugged terrain.

## **2. Preparedness Actions**

Preparedness" refers to activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination. Preparedness includes planned activities for the development and implementation of the wildland fire management program. These activities include staffing, training, fire prevention activities, education, provision and maintenance of support facilities, purchase of and contracting for equipment, supplies, support, planning and coordination, policy development and oversight, research, and interagency coordination."

Departmental policy requires that all personnel engaged in wildland fire suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG, *PMS-310-1*). Timpanogos Cave NM will conform strictly to the requirements of the NPS wildland fire management qualification and certification system.

Although Timpanogos Cave NM has no specific wildland firefighter positions, employees will be encouraged to become qualified as wildland firefighters in order to support the Park's fire management program. The Park Fire Coordinator will be responsible for obtaining the training required to meet Park needs for qualified wildland firefighters. When advanced or specialized training is necessary, the Park Fire Coordinator will work through the Area Fire Management Officer to obtain funding and enrollment. The Park Fire Coordinator will coordinate the Park's fire training needs with those of other nearby parks, cooperating agencies, and the region. Park wildland firefighters will attend an annual wildland firefighter safety refresher.

### **a. Prevention Strategy**

The Fire Prevention Strategy for TICA is to prevent any human caused fires and reduce any damage caused by fire.

Wildland fire prevention activities generally fall within one of the four broad categories that follow:

- **Education** that is aimed at changing people's behavior by awareness and knowledge; this can be done through printed materials, mass media, one-on-one contacts or group

presentations. Information can also be delivered through signs, displays, fairs, parades, etc.

- **Engineering** is an activity designed to reduce or eliminate fire risks and hazards. Fuel management and hazard reduction addressed in another section of this plan will also assist in attaining the objective of reduction of resource loss.
- **Enforcement** is used to gain compliance with fire regulations and ordinances.
- **Administration** is those activities including planning, budgeting, training, etc.

Specific Items that Warrant Special Mention:

- **Burning Permits:** Due to the character of the area and surrounding lands, there is a risk of an escaped human-caused fire. A burning permit program is in place in the communities outside of the canyon that require a local fire protection authority to inspect the area to be burned prior to issuing a burning permit. The city of Highland requires burning permits from May 10<sup>th</sup> through October 10<sup>th</sup> annually. Timpanogos Cave National Monument will not conduct any pile or debris burns inside the monument.
- **Public Information/Education:** As mentioned above, Public Information and Education is accomplished using a variety of methods. This is the area of emphasis that can establish and maintain support for the Fire Management Program as a whole. By keeping the public informed of what and why a project is implemented gains support for the entire program. Also remembering to say THANK YOU to the local communities at the end of the fire season for the help provided in reducing the number of fires is critical.
- **Closures/Restrictions:** TICA will coordinate closures and restrictions with the Eastern Great Basin Coordination Center. NPS guidelines for determining the need for Park closure/evacuation are contained in *NPS Manual #77*. Because of the critical time elements involved in closure and evacuation the checklist provided in *NPS Manual #77* should be completed anytime two or more of the elements in the Fire Behavior section (primary factor A) on the list are answered “YES.”

During periods of extreme fire danger, the public will be made aware of the situation through news releases, by posting and distributing fire danger notices. All unnecessary park activity should be curtailed.

At such time the Fire Danger Levels (Low, Moderate, High, Very High, and Extreme) are activated, the requirements may affect Park programs. The NUIFC fire dispatch office will keep all personnel informed of the current

precaution level in effect; announcement will be made over the Two-Way Radio and/or by calling the TICA office.

Closures/Restrictions are never desired, however there are times when the fire danger warrants restricting the general public, employees' families and employees of TICA from burning activities.

The current "EGB" Closure and Restriction Procedures" are located on the internet at: <http://www.blm.gov/utah/egbcc/> These procedures shall be followed, and during times of fire closure, written notice signed by the superintendent will be posted at all public access locations in the monument.

- **Trespass/Arson Investigation:** All current fire investigations will be done by National Park Service, Forest Service, or the Utah County Sheriff's Office. These agencies have proprietary jurisdiction on TICA. The objective of any investigation is to determine cause. If TICA or the Utah County Sheriff's Office does not have a qualified fire investigator or one is not readily available, NUIFC will be contacted. One will be found within the zone to assist with the investigation.
- **Enforcement:** At this time any enforcement of laws and regulation is accomplished through the NPS law enforcement personnel or the Utah County Sheriff through proprietary jurisdiction on TICA.
- **Hazard Abatement:** Hazard abatement is a task that is designed to reduce the fire risk in an area. This can be accomplished through Hazardous Fuel Reduction projects that can be planned for those areas that have high fire occurrence, reducing the fire hazard and improving the ecological conditions and wildlife habitat.
- **Fire Prevention:** Public education through signage and personnel contact will be used for fire prevention. Assisted by Uinta National Forest, posted and other signs will be used notifying the public of increased fire hazards and fire restrictions. Roving personnel will be used to enforce fire restrictions during extreme fire danger.

#### **b. Training & Qualifications Program**

TICA is supported by the Eastern Great Basin Coordination Center (EGBCC). Wildland fire training for TICA personnel will be coordinated through and from the Northern Utah Interagency Fire Center office. In the event any emergency fire crews are recruited for fire suppression they will receive S-130, S-190, I-100 and Standards for Survival prior to being assigned to fires. All individuals recruited will comply with the fitness standards of the recruiting agency. No emergency crews will be recruited or trained until NUIFC has established that adequate qualified supervision is available.

All personnel assigned to assist with fire management duties will be qualified for the position assigned. Certification of qualifications will be documented on a "Red Card" in the possession of the person assigned. Zion National Park will maintain the Red Card system for TICA and issue Red Cards to any fire qualified personnel on TICA. Red Card records will be kept at Zion National Park and at TICA Administration. The Northern Utah Interagency Fire Center will have a record of all Red Carded TICA personnel and their qualifications in order to keep track of all agency personnel in the Central Zone for dispatching mobilization purposes and for maintaining availability lists.

The incident office support duties will be the contact between TICA, Utah County, NUIFC and the protecting agency. These personnel will be trained and have a basic knowledge of fire behavior and tactics necessary to support personnel assigned to fires any place on Timpanogos Cave National Monument. It may also be important, as these personnel may have to take an initial report of a fire on TICA and turn in this information to the protection agency prior to initial attack. This is extremely important near the urban/rural interface in and around TICA.

Timpanogos Cave personnel will be required to meet the standards outlined in NWCG 310-1, "Wildland Fire Qualifications Subsystem Guide." Park personnel trained and qualified for wildland fire management activities will be encouraged and supported to participate in a physical fitness program.

**List of unit Personnel and their Qualifications (current and target qualifications):** Due to the many changes that take place in qualifications and personnel, a complete current listing is prepared annually and maintained in the Northern Utah Interagency Fire Center Office and TICA Administration. TICA will attempt to train and maintain (1) type 5 incident commander, (1) firefighter type 1, and (3) firefighter type 2.

**Table 5. Anticipated fire staffing levels at TICA.**

(1) Park Superintendent (1) Chief Ranger (2-4) Seasonal Red Carded Staff
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**c. Preparedness Strategy**

As stated in the Wildland Fire Management Policy, preparedness activities are carried out prior to a fire occurrence to ensure that the appropriate response to that fire can be accomplished. Preparedness activities include: budget planning, equipment acquisition, equipment maintenance, equipment inventory, recruitment, training, reviewing and revising if needed any cooperative agreements, and meeting with cooperators. The objective of the preparedness effort is to have a well-trained and well-equipped fire management organization in place to manage all fire situations within TICA.

Preparedness Reviews will be conducted annually according to the interagency *Fire Preparedness Review Guide* found at [www.fire.blm.gov/standards/precont.htm](http://www.fire.blm.gov/standards/precont.htm)

Fire Management Leadership: Timpanogos Cave National Monument will rely on Zion National Park and the Uinta National Forest, Pleasant Grove Ranger District, fire management officers (FMO) to assist in providing fire management leadership for the TICA fire management program. The assistance given by these FMO's will provide fire management leadership training to Timpanogos Cave National Monument, Wildland Fire Coordinator/ Chief Ranger, and other TICA personnel in order to strengthen skills, knowledge and abilities of TICA to manage their fire management program more independently in the future.

Detection: TICA does not have any established fixed detection lookouts located on the property. Due to the small size of the Park (250 acres) and its close proximity to the cities of Alpine and Highland, and highway 90, most detection reports originate from the public or NPS personnel. The Uinta National Forest does not schedule aerial detection flights during the fire season that patrols the surrounding mountain range. Only when sight of a fire is reported are aerial flights requested. Sightings are reported to the Northern Utah Interagency Fire Center who, in turn, will report them to the TICA office.

Agreements: Cooperative Agreements have been entered into with the Lone Peak Fire Department for structure protection. This agreement provides that the Lone Peak Fire Department will assist with the initial attack of any structure fire, not wildland fire, on TICA land. All Cooperative Agreements between TICA and other entities can be found in **Appendix E**.

There is a "Master Cooperative Fire Management Agreement" between; United States Department of Interior, Bureau of Land Management; State of Utah DNRC, National Park Service, Intermountain Region; Bureau of Indian Affairs; United States Fish and Wildlife Service, Intermountain Region; and the United States Department of Agriculture, Forest Service, Eastern Great Basin Region that provides the authority "to coordinate efforts for prevention, detection, and suppression of wildland fires and for fuel management in and adjacent to their areas of responsibility, and to limit duplication, and improve efficiency and effectiveness." This agreement expands cooperative fire suppression capabilities. This agreement requires a local operating plan be developed and updated between all cooperators annually. This operating plan is completed annually by the Northern Utah Interagency Fire Center and can be found in **Appendix E** of this document.

The Uinta National Forest, Pleasant Grove Ranger District and the State of Utah DNRC will provide additional initial attack resources for the immediate suppression of any wildland fire on TICA.

Copies of the complete agreements are available for review and reference at the TICA Office and the Northern Utah Interagency Fire Center.

TICA Staff will annually review their Cooperative Agreements and annual operating plan making sure they are adequately covering areas of potential joint responsibility and cooperation.

Shared Resources: TICA employees can be made available to staff a Type II crew within the Eastern Great Basin Zone (Northern Utah Interagency Fire Center.) They are available for fire assignments nationally from when they normally begin work (after adequate training) through the end of their appointment annually.

A directory of trained and available personnel is established each year during fire season and maintained in the Northern Utah Interagency Fire Center Office and the TICA Administration.

Non-fire Support, Overhead: A current up to date Red Card directory of all fire qualified TICA personnel is maintained at the TICA Administration and the Northern Utah Interagency Fire Center Office. This listing can change daily based on availability, changes in qualifications, transfers, and physical fitness.

Air Operations: Aircraft are the most effective and safest means of suppressing fire beyond the range of pumper trucks that are restricted by the limited road access. Use of aircraft will conform to policies established in NPS Directors Order #60, Reference Manual #60, and the Intermountain Region Aviation Policy and Reference Manual. TICA may periodically need a helicopter for fire suppression operations. NUIFC stations a National Shared Resource Type 2 helicopter as well as three Type 3 helicopter for incidents. The fire management program at TICA does not currently need a contract helicopter.

TICA will request and order aircraft and associated support from the Northern Utah Interagency Fire Center. TICA will provide the need for the assistance, the type of aircraft needed, and the funding code for which the mission and aircraft will be paid, and if non-fire or project oriented mission.

Adequately qualified personnel will staff the aircraft to insure all agency aircraft safety policies and procedures are followed. Zion National Park or the Uinta National Forest will provide TICA with aviation officer expertise for any aircraft related projects, issues, or assistance in developing plans.

When a mission is completed, the aircraft will be released back to the Northern Utah Interagency Fire Center.

Aircraft Facilities: TICA will utilize the Provo or SLC (Salt Lake City) airport for any fixed-wing operation needed by the Park. There is no location in the monument that can be made safe for use as a helispot. Helispots can be located outside American Fork Canyon, or at a few locations on the Uinta National Forest. A helispot will be established to adequately support air operations for any mission undertaken by the Park. This will be identified ahead of time and signed in order to provide adequate warning of the need for that site in time of emergency.

#### **d. Fire Weather and Fire Danger**

Three automated weather stations are in operation in TICA. Records can be kept year-round. Indices will be generated from approximately April 1 through October 31 annually. The nearest RAWS station within the zone is the Pleasant Grove Station.

The National Weather Service will distribute morning fire weather forecasts, afternoon updates, fire weather watches, and red flag warnings as specified in their annual operating plan. All dispatch/coordination centers and unit dispatchers will be responsible for distributing fire weather information to firefighters and incident management personnel at initial attack bases, staging areas, field locations, and committed to initial attack/extended attack incidents. Weather information is available on the Internet at:

<http://www.blm.gov/utah/egbcc/Reports/weekly.pdf>

Regular Forecasts: A normal fire weather forecast can be retrieved about 1600 PDT during low level service. During normal level service (PL-3), one forecast will be pulled at 0830 PDT and the afternoon forecast at 1630 PDT. The Dispatch Office will make these forecasts available to all fire management personnel via the established communications system. These forecasts can be obtained from the National Weather Service website at:

<http://www.blm.gov/utah/egbcc/Reports/weekly.pdf>

Special Forecasts: Requests for spot forecasts will be handled any time. Call NUIFC to request a spot weather forecast. Use the spot weather forecast form that is currently adopted by the National Weather Service out of Salt Lake City, Utah. NUIFC will call TICA when the spot weather forecast has been completed. The status of the spot weather forecast can also be checked on the Internet at:

[http://www.wrh.noaa.gov/cgi-bin/ifps\\_spot/spotmon?site=slc](http://www.wrh.noaa.gov/cgi-bin/ifps_spot/spotmon?site=slc)

**e. Step-up Staffing Plan**

Fire Preparedness Levels: Fire Preparedness Levels are established nationally by the National Interagency Fire Center, Boise, Idaho; and regionally or sub-regionally by the EGBCC. These various levels, 1 through 5, identify the level of wildland fire activity, severity, and resource commitment area wide. The differing levels identify actions to be taken by TICA personnel to ensure that an appropriate level of preparedness/readiness is obtained for the existing and potential situation. Depending upon the Fire Preparedness Level, modification or curtailment of fire management activities may be required to assure preparedness or response capabilities. In the following charts, the Chief Ranger is the Resource Management Specialist at TICA who reports directly to the Park Superintendent and is responsible for the TICA fire management program. The Chief Ranger will consult with Zion National Park and Eastern Great Basin Coordination Center for guidance and assistance in those aspects of the program needing support. TICA will staff and administer its fire program as described in the step-up plan below. During the fire season regular contact with Pleasant Grove RD will provide the fire danger rating values for staffing and program readiness. The following Step-Up Plan shall fit within the Fire Preparedness Levels 1 through 5 so that coordination between TICA and its interagency cooperators is optimal.

**Step-Up Plan**

The Superintendent and Chief Ranger have the authority to take necessary measures such as hiring additional equipment and personnel during periods of elevated fire danger at levels 4 and 5. During the other times of the year routine fire preparedness activities and hazard reduction should occur. The actions below are commonly called the “Step-Up” plan and ascend with deteriorating region-wide conditions, and/or elevated local fire danger (as measured at the Pleasant Grove RD).

**Staffing Class 1:**

- Fire danger rating is low-moderate and the BI values are 1-22
- No lightning activity forecasted next three days

**Preparedness actions are as follows:**

- Daily fire weather assessment by the Chief Ranger
- Fire equipment and tools are ready for use
- Public information is current.
- Prescribed fires conducted if approved, debris burns OK
- Conduct training and preparedness activities

**Staffing Class 2:**

- Fire danger rating is moderate to high and the BI values are 23-33
- Lightning activity level 2, or lower.

Preparedness actions are as follows in addition to those of “1”, above:

- Obtain daily fire weather and post any special fire weather advisories by Chief Ranger
- Chief Ranger confirms IA dispatcher on duty with B-D until 1800.
- Chief Ranger updates NUIFC with staffing status Monday and Friday (for weekend)
- Normal project activities

**Staffing Class 3:**

- Fire danger rating is high and the BI values are 34-44
- Lightning activity level 2-3, or lower

Preparedness actions are as follows in addition to those in 1 and 2, above:

- Superintendent liaison with EGBCC, UT. Zone for consideration of restrictions
- Chief Ranger track 3-5 day Wx forecasts in addition to the twice daily forecasts
- Update NUIFC daily with resources and staffing availability and status
- New ignitions re-evaluated by Chief Ranger/RXB2
- Project work is to be patrolled at least ½ hour after work is stopped
- Available, on duty, redcarded staffing has 10-minute get-a-way time for IA

**Staffing Class 4:**

- Fire Danger rating is Very High with BI values 45-54
- Lightning activity level 3+ with observed lightning and/or thunder heard\*

Preparedness actions are as follows in addition to 1-3, above:

- Superintendent's Liaison with NUIFC to coordinate closures and /or restrictions
- Daily situation report to IMR; coordination schedule established with Zion.
- Superintendent or Chief Ranger on-call seven days, or designate acting Supt/Chief Ranger
- Chief Ranger requests activation of emergency preparedness account-ZION/IMR
- IA resources available for extended daily tour and 7 days per week
- Daily briefing for IA crews; Wx, Safety, Situation, etc.
- Patrols of IA area and prevention contacts made by IA crew
- Superintendent/Chief Ranger update standard WFSA and delegation of authority with current objectives and management constraints.
- Public will be notified of fire danger at VC and entrance stations.

**Staffing Class 5:**

- Fire Danger rating is Extreme with BI values above 55.
- Lightning activity level 4 to 5 with observed ground strikes in the area\*

Preparedness actions are as follows in addition to 1-4, above:

- Implement fire closures and restrictions with interagency coordination
- An additional engine, a hand crew squad, and/or other initial attack resources deemed necessary are authorized and 'on the board' with NUIFC
- Respond co-operatively to NUIFC resources requests

- \* Predicted LAL's 4, or above elevate the Staffing class to 4. Observed lightning immediately elevates the Staffing level to "4", or "5", depending on the judgement of the duty-officer and in coordination with the B-DNF. Judgment is necessary, taking into account time of year and fuel flammability conditions.

#### **f. Fire Business Management**

All fire business and personnel management activities must comply with instructions contained in RM-18, Fire Management Compendium, and Interagency Incident Business Management Handbook. The TICA Administrative Officer will be responsible for coordinating fire business management issues/concerns and reporting. Zion National Park will provide technical support in fire business management.

### **3. Pre-attack Plan**

TICA Pre-attack information is placed within the appendix of this Wildland Fire Management Plan. There are maps in **Appendix H** that lists facilities, roads, water sources, buildings/structures, and other data. Information such as contact numbers and names must be updated as changes occur.

### **4. Initial Attack**

Initial attack (IA) on all wildland fires will be immediate and aggressive suppression action, consistent with firefighter and public safety, and values to be protected. The primary objective would be to extinguish all fires at the earliest time, keeping them to their smallest possible size.

#### **a. IA Priorities**

A listing of information for setting suppression priorities (sensitive features to be protected) is shown in Section XI "Protection of Sensitive Resources" in this Wildland Fire Management Plan. Risks, costs, and safety will be immediately assessed to guide the Appropriate Management Response (AMR).

#### **b. Appropriate Management Response**

The appropriate management response to any wildland fire occurring on all lands administered by TICA is safe, aggressive initial attack control actions. In the event of a fire escaping from the initial attack, then the Superintendent or Resources Management Specialist shall prepare a Wildland Fire Situation Analysis (WFSA), (**Appendix G**). Ideally the

Incident Commander of the escaped fire is available to assist TICA for tactical input to the document. Other significant management criteria need to be considered in the decision process. These criteria are shown in the section entitled “XI. Protection of Sensitive Resources.” The order for reinforcements to conduct the suppression effort would be placed through NUIFC.

The optimal combinations of suppression oriented appropriate management responses are available. Firefighter and public safety is the number one consideration when deciding strategy and tactics for the suppression of any wildland fire. It may be necessary to conduct an indirect attack, sacrificing more burned acres but increasing the safety of personnel. This is a decision that must be made in a timely manner to ensure meeting the suppression and safety objectives of the incident. A wildland fire that is under a suppression oriented response is, by definition, an unwanted event and must be suppressed minimizing loss of resource values, economic expenditures, and/or the use of critical firefighting resources but providing for firefighting and the public safety as the highest consideration.

Initial Attack Mobilization Strategy: The initial report of a fire will be immediately transmitted to NUIFC. Zion National Park dispatch and the Intermountain Regional Office will be notified as soon as reasonable. The Chief Ranger is responsible for this reporting. The fire initial attack and size-up format is identified in the “Redbook”.

Initial attack forces respond out of three locations – Uinta National Forest – Pleasant Grove Ranger District, State of Utah DNRC and TICA. The tour of duty for all Park management staff and seasonal employees includes weekend (Saturday and Sunday) work: 0900-1800 hours. The NUIFC fire dispatch hours are 0800-1800 hours, except during emergency operations then the hours are 24 hours a day. As a general rule, red carded employees nearest the fire will be dispatched regardless of whether or not they are members of the initial attack organization.

An aggressive first attack by initial attack forces and equipment will be made if safe to do so. The IC calls for the use of a helicopter with a water bucket for initial attack, if needed and when available. Air drops of chemical retardant will be evaluated immediately for possible effectiveness and effects to area watersheds. The nearest fire retardant base is located in Salt Lake City, 55 air miles to the North. The next closest base is in Nephi, 59 air miles to the South.

The first fire trained Uinta NF, State of Utah DNRC or NPS employee reaching the fire will be the IC until relieved by a more qualified firefighter. The Chief Ranger, NUIFC, and assisting fire protection agency will

designate and assign an IC commensurate with the complexity of the incident.

Immediate support by additional crews will be assigned as called for by the IC. All support needs by additional resources will be requested through NUIFC.

When a fire cannot be contained by Initial Attack forces, the initial attack IC will report to the Park Superintendent or Chief Ranger and to NUIFC that the incident is an Extended Attack Incident. The complexity of the incident will determine the type of incident management team to be considered (utilize complexity analysis in the Redbook). TICA fire managers should confer with cooperating agencies that have more experience in the management of large wildland fires to assist with the decision on wildland fire complexity and IUT type to consider. The need for an Incident Management Team will be coordinated between the Uinta National Forest, Pleasant Grove Ranger District and Zion NP as soon as possible, and ordered through NUIFC.

**c. Confinement Strategy**

Confinement, one option utilizing the Appropriate Management Response (AMR), can also be a strategic selection through the WFSA process when the fire has exceeded initial attack capability or is evident that it will soon escape control efforts. It would be selected in combination with other strategies to fulfill TICA protection obligations.

**d. Fire Response Times**

Typical fire response times by Park personnel to a fire within the Park boundaries are less than 30 minutes, during fire season duty hours. Normally ½ to 1 hour would be the response time depending on location of resources.

**e. Restrictions and Special Concerns by Management Area**

Refer to the Chapter on Protection of Sensitive features.

**f. Other Issues**

Other issues that need to be considered by TICA personnel when managing fires (initial attack or extended attack) are: 1) relationships with other local fire protection agencies, 2) providing information on fire status and fire danger conditions to the Cities of American Fork, Highland, and Alpine (Lone Peak) and County Commissioners, 3) Hiring of local people to assist on fire or in support positions, 4) Recycling, 5) Firefighter R&R and logistics support, 6) Road Closures and traffic control, 7) Evacuation of visitors, park residents, and employees,

## **5. Extended Attack & Large Fire Management:**

### **a. Determining Extended Attack Needs**

The fire program at Timpanogos Cave National Monument does not support the capacity for an extended attack for two reasons; 1) the size of the park is less than 2000 acres. A fire situation that demands extended attack strategy and tactics will be beyond the boundaries of the park. 2) The staff at the park is small and will only be prepared for initial response and support for initial attack.

The park coordinates all fire fighting efforts with three organizations: the Northern Utah Interagency Fire Center, Zion National Park, and the U.S. Forest Service Uinta National Forest. The network provided for in the interagency organization ensures a coordinated response to a fire and support for an extended attack.

Extended attack needs should be determined at the time initial attack of a wildland fire has been unsuccessful. TICA is not in a position to provide all needed support for an extended attack wildland fire; coordination with the U.S. Forest Service Uinta National Forest is recommended. If a fire escapes initial attack, the Northern Utah Interagency Fire Center must be contacted to order needed personnel, equipment and supplies to adequately staff for the extended attack operation. As a minimum, a Type 3 Incident Management Organization should be implemented. This would consist of a T3 IC, Division Supervisor(s), Logistics support personnel, Planning support personnel and Time Recorder.

If the incident complexity analysis increases, there may be a need to order a Type II or Type I Incident Management Team. Unified Command with the USFS is a real possibility for a larger incident with the fire on NPS and adjacent USFS lands. If it is determined that this must occur, TICA will contact the Northern Utah Interagency Fire Center to order the IUT. Northern Utah Interagency Fire Center will place the order and inform TICA of order status.

### **b. Implementation plan requirements – Wildland Fire Situation Analysis (WFSA) development:**

When a fire escapes initial attack, a new strategy must be developed to suppress the fire. This selection process is accomplished through the development of a WFSA.

The WFSA is a decision process that employs a systematic and reasonable approach to determine the most appropriate management strategy for a particular situation. Reasonable management alternatives

are identified, analyzed, and evaluated, and are consistent with the expected probability of success /consequences of failure. The Superintendent shall approve the WFSAs and any revisions. Evaluation criteria include firefighter safety, anticipated costs, resource impacts, and social, political, and environmental considerations. The evaluation of alternatives becomes the triggering mechanism for re-evaluation of the WFSAs. An electronic version of a WFSAs can be found at the U. S. Forest Service website at <http://www.fs.fed.us/fire/wfsa/>.

**c. Complexity Decision Process**

This process is a guideline that is used by the Agency Administrator and Fire Manager to determine what type of management is needed for a particular incident. It is part of the WFSAs planning process, and WFSAs computer software.

**d. Delegation of Authority**

The Delegation of Authority is a memo from the Park Superintendent to the Incident Commander of an Incident Management Organization, giving the responsibility to manage the wildland fire. This memo addresses the important operational objectives usually addresses all the Operational Objectives, WFSAs selected alternative, limitations and constraints as well as any other resource issues needing identified by the Superintendent. A DOA is provided to the Prescribed Burn Boss implementing any RX Burn plans while working for the Superintendent at TICA.

**6. Exceeding Wildland Fire Situation Analysis (WFSAs)**

When an incident has exceeded initial attack capabilities, the designated IC, Chief Ranger or Park Superintendent, will prepare a WFSAs with assistance from other agency fire managers (i.e., Zion NP, Uinta NF). The WFSAs is a management tool to aid line officers, fire managers and Incident Management teams in analyzing the complexity of a given fire situation. The WFSAs is used to develop alternative strategies for suppression of escaped fires and the evaluation of the net effect of each of those alternatives. The superintendent or his/her delegated official will be the approving authority for the document.

*Threshold Conditions Triggering a WFSAs:*

- A WFSAs shall be initiated when an initial attack suppression response fails.
- Fire is projected to leave TICA jurisdiction and is anticipated that IA may not be successful.
- Fire is projected to be beyond the capability of the TICA and cooperating agencies resources.

In multi-jurisdictional incidents, the WFSAs will be completed jointly by all cooperators having jurisdictional responsibility and the related fire protection authority.

Personnel or equipment will not proceed to fires without clearance from NUIFC. In cases where personnel and equipment arrive at a fire without prior clearance, the dispatcher will be notified immediately to enable dispatch to facilitate the planning and make necessary readjustments.

Notify the Intermountain Regional Office and Zion National Park as soon as reasonable of wildland fires.

### **7. Minimum Impact Suppression Tactics (MIST)**

TICA will consider use of all MIST guidelines before using tactics that will have a greater impact on the resources. Safety of firefighters and/or public will not be compromised with the use of MIST. Reference the Redbook.

### **8. Long-Term Rehabilitation Guidelines**

Often the impacts of fire suppression and other management actions require some rehabilitation. Short and long term impact mitigation measures are outlined in Reference Manual RM-18, DOI BAER Handbook, and Director's Order-18. Park guidelines for rehabilitation include the following:

- The Appropriate Management Response (AMR) and MIST tactics will guide suppression actions to minimize potential fire suppression impacts.
- Mitigation of suppression damage will be specified in incident action plans, and implemented by the ICS organization.
- BAER plans will be prepared as necessary to specify long-term mitigating actions, submitted to the NPS Intermountain Regional Office within five (5) days following control of a wildland fire.

Refer to Chapter X – Protection of Sensitive Resources, for identification of sensitive resources important to track in terms of damage from fire suppression or from fire effects. The Chief Ranger shall be the TICA Resources Advisor, and will be responsible for emergency consultation with the FWS and SHPO.

### **9. Wildland Fire Records & Report Tracking**

There are various records and reports that are required in Wildland Fire Management within the National Park Service. Copies of all reports will be forwarded to the Zion National Park office.

Refer to RM-18 for listing of records and reports required by the National Park Service. DI-1202 – Fire Report Form is the main form necessary for reporting of all individual wildland fires. Any WFSA must be submitted with the DI-1202 to Zion National Park.

### **C. Wildland Fire Use**

This option was rejected due to the smaller size of the Park, the significant degree of wildland urban interface along the Park boundary and the lack of available qualified personnel required to manage these fires. All unscheduled wildland fires in Timpanogos Cave National Monument will be suppressed using the most appropriate management action.

### **D. Prescribed Fire**

A program of using prescribed fire at Timpanogos Cave NM is not considered in this Plan. However, if a determination is made that a specific prescribed fire is required, that prescribed fire will be subject to the requirements of NEPA, the NHPA and other applicable regulations. All prescribed fire operations will adhere to NPS prescribed fire policies and procedures found in RM-18.

#### **1. Planning and Documentation**

a. An approved burn plan will identify need resources, individual responsibilities, and timelines. These activities include scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits.

b. Long-Term Prescribed Fire Strategy

The purpose of prescribed burning at Timpanogos Cave would be to protect and preserve the cultural resources of the Monument, manage vegetation (specifically invasive plant species), and reduce fuel loading. Prescribed fire objectives will be to:

1. Manage vegetation to maintain vistas and to promote the growth of native grasses and control woody vegetation on earthworks
2. Assist with the establishment and maintenance of the historic scene

#### **2. Needed Personnel**

Timpanogos Cave NM does not have sufficient personnel trained to manage a prescribed fire. Personnel needed for a specific burn will be identified in the projects burn plan. The Park will participate in a coordinated approach to mutual prescribed fire programs with partners to be determined at the time of the burn.

#### **3. Fire Weather, Effects, and Behavior Monitoring**

Monitoring of prescribed fires at Timpanogos Cave is intended to provide information for quantifying and predicting fire behavior and its ecological effects on Monument resources while building a historical record. Monitoring measures the parameters common to all fires: fuels, topography, weather, and fire behavior. In addition, ecological changes such as species composition and structural changes will be

monitored for several years after a fire. This information will be very useful in adjusting the prescribed fire program to better meet short and long-term resource objectives.

During prescribed burning, monitoring will include mapping, weather, site and fuel measurements, and direct observation of fire characteristics such as flame length, rate of spread, and fire intensity. Operational monitoring provides a check to insure that the fire remains in prescription, and serves as a basis for evaluation and comparison of management actions in response to measured, changing fire conditions, and changes such as fuel conditions and species composition.

All prescribed fires will be monitored regardless of size. The Chief Ranger will establish specific fire information guidelines for each fire to update intelligence about the fire.

FTS automated weather stations are in operation at Lone Peak, Picnic Point, and Canyon Rim. Records can now be kept year-round. Indices will be generated from approximately April 1 through October 31 annually. Pleasant Grove RAWS station within the zone is the closest representative site to be used as a guide for TICA preparedness activities.

Specific weather prescription parameters will be developed as a part of each individual Prescribed Burn Plan. The Prescribed Burn Plan weather parameters will be measured on site, before, during and after a prescribed fire to ensure the fire is within prescription (Level 1 and 2 monitoring).

The National Weather Service will distribute morning fire weather forecasts, afternoon updates, fire weather watches, and red flag warnings as specified in their annual operating plan. All dispatch/coordination centers and unit dispatchers will be responsible for distributing fire weather information to firefighters and incident management personnel at initial attack bases, staging areas, field locations, and committed to initial attack/extended attack incidents. Weather information is available on the Internet at: <http://fire.boi.noaa.gov/FIREWX/SLCFWFSLC.html>

**Regular Forecasts:** Weather observations will be entered into the WIMS computer system by NUIFC and a normal forecast retrieved about 1600 PDT during low level service. During normal level service, one forecast will be pulled at 0830 PDT and the afternoon forecast at 1630 PDT. The Dispatch Office will make these forecasts available to all fire management personnel via the established communications system.

**Special Forecasts:** Requests for spot forecasts may be submitted at any time. The new Internet spot weather forecast process is to be used, accessed at: <http://www.wrh.noaa.gov/radar/loop/DS.p37cr/si.kmtx.shtml>

#### **4. Prescribed Fire Project Review**

Any prescribed fire will have a Prescribed Burn Plan. After completion of a prescribed fire, participating personnel will review the fire, elements contained in the Prescribed Burn Plan, complete any monitoring and evaluation requirements, then critique the fire.

The objective will be to understand and improve prescribed fire techniques, operations, prescriptions and the fire effects.

## **5. Reporting and Documentation Requirements**

A Prescribed Burn Plan is necessary for conducting any prescribed fire and should be kept on file. Smoke management reporting and documentation is required. Refer to Section E in this Chapter for Air Quality/Smoke Management guidelines. All reporting will be accomplished according to RM-18 guidelines. A DI-1202 will be completed for each RX burn conducted at TICA.

## **6. Historic Fuel Treatment**

Historic fuel treatment practices at TICA have been restricted to mechanical removal of limbs and dead trees as well as herbaceous and shrub vegetation within the vicinity of historic and administrative structures.

## **7. Local Prescribed Burn Plan**

Any prescribed fire planned and implemented within the boundaries of TICA will have a Prescribed Burn Plan prepared by a qualified Prescribed Burn Boss, reviewed by the Chief Ranger, reviewed by a non-TICA fire specialist, then approved by the Park Superintendent prior to ignition. The Prescribed Burn Plan will follow the RM-18, Chapters 4 and 10 policy and guidelines. The plan peer review process is required in advance of the final approval by the Superintendent, and subsequent Prescribed Burn.

## **8. Exceeding existing Prescribed Burn Plan**

If a prescribed fire exceeds the parameters set forth in the Prescribed Burn Plan, the fire will be considered out of prescription. If the fire can be brought back into prescription that same operational period with existing resources and funding, the fire can continue until all objectives are met. If the fire cannot be brought back into prescription with existing resources and/or funding, it will be designated as a wildland fire. An appropriate management response will be taken on the newly designated wildland fire. If the fire cannot be controlled and becomes an extended attack wildland fire, a WFSA will be initiated and approved by the Park Superintendent. The Burn Boss shall become the Incident Commander until relieved.

## **9. Air Quality & Smoke Management**

TICA is responsible to report all prescribed fire to NUIFC. TICA will obtain smoke management/air quality forecasts from NUIFC or from the Utah State Air shed Group Smoke Monitoring Unit website at [www.utahsmp.net/](http://www.utahsmp.net/) prior to conducting any prescribed fire on TICA. TICA will follow all smoke management guidelines and restrictions.

Contained within the ***Northern Utah Interagency Fire Center Mobilization Guide*** is a list of duties that NUIFC is responsible for within the Central Utah NUIFC Zone. In these duties the following apply to Air Quality & Smoke Management:

Collect and distribute weather information, forecasts and NFDRS indices for the NUIFC Zone.

Monitor the prescribed fire program, including brush disposal and coordinate the smoke management program for the NUIFC Zone. Also, act as airshed coordinator for Airshed 5 and 7. Provide support to prescribed fire projects as requested.

An Incident and Action Report will be issued for all reports of smoke/fires that come to the NUIFC.

NUIFC will read morning and afternoon fire weather and fire weather watches and red flag warnings over the radio. Fire Weather Warning and Red Flag Warning will require acknowledgement from units in the field and district duty officers.

Prescribed fire – NUIFC needs to be informed of any prescribed fire being done so that the appropriate monitoring agencies are informed. Agency conducting prescribed fire needs to assign a prescribed fire number, location, prescribed fire type, acreage and airshed number. NUIFC will advise burners by 1000 if any burning restrictions will be in effect that day. The Utah State Air shed Group will maintain a web page and restrictions will be posted at <http://www.utahsmp.net/> by 1600 Monday – Friday. Restrictions for Saturday, Sunday and Monday will be posted on Friday afternoon.

A copy of the Utah Smoke Management Plan is attached in **Appendix F** of this Wildland Fire Management Plan. This operating guide addresses specific topics; such as; organization, reporting procedures, essential winter burning, membership guidelines, complaint process and procedures, major duties of the coordinators, board and representatives, and operating procedures for the Monitoring Unit.

TICA is a member of the Utah State Air shed Group through the National Park Service representation on the Board of Directors.

## **10. Debris Burning**

Fire is occasionally used to dispose of natural vegetative debris deemed infeasible or impractical to remove mechanically in a non-wildland fuel environment (parking lot, storage yard, gravel pit, etc.). The debris may be generated from routine maintenance activities, piled debris generated from construction activities, removal of hazard trees, discarded building and administrative materials. Any material being burned for debris disposal must be classified as permissible to burn under applicable Federal, State, Tribal, and Local regulations.

Debris burned in non-wildland environments do not require a prescribed burn plan. Debris burned in a wildland environment, including snow-covered ground, requires a prescribed fire plan.

Due to the lack of a suitable location, hand piling and burning activities are not planned within the monument. Slash from mechanical thinning or routine maintenance will be hauled from the monument and disposed of at the Utah County landfill or other approved location. If a pile burn were to be conducted it would occur on national forest, County, or municipal lands under the requirements of the appropriate jurisdiction.

## **E. Non-Fire Applications**

### **Mechanical Treatment Program**

#### **a. Annual Activities**

Opportunities exist for mechanical thinning and mowing in the wildland urban interface for reducing risks to adjoining landowners and elsewhere in riparian/woodlands for reducing risks within the monument. Mechanical treatment includes activities undertaken using equipment or hand tools. Hand tools and chain saws would be used to remove brush and tree regeneration. Tree thinning would be used to maintain canopy spacing. Dead and downed woody debris removal would be used to reduce ground fuel. All fuels removed would be chipped and removed.

Due to lack of a suitable location, hand piling and burning activities are not planned within the monument. When the slash from mechanical thinning is hauled from the monument it will either be disposed of at the Utah County land fill or other approved location. If a pile burn were to be conducted it would occur on national forest, County, or municipal lands under the requirements of the appropriate jurisdiction.

#### **b. Required Monitoring**

Monitoring will be done to determine if the project objectives were met. This monitoring may be through the use of photo plots, vegetation transects, or a visual assessment.

#### **c. Critique Format**

Accomplishment of objectives, methodology, cost effectiveness, safety issues, and resource damage are some of the topics to be discussed. A written project completion report incorporating the findings of the critique will be forwarded to the Area Fire Management Officer.

#### **d. Funding and Cost Accounting**

FIREPRO funding requests for individual projects may be submitted to the Area Fire Management Officer. Documentation of individual project costs will be submitted to the Area Fire Management Officer for review. Expenditures will not exceed the authorized project amount.

#### **e. Reporting and Documentation**

All project forms will be completed as outlined by the Park Fire Coordinator. All records will be archived with the Park's fire records for future use and reference. A completion report will be forwarded to the Area Fire Management Officer.

The Park Fire Coordinator is responsible for preparing a final report on each project. Information will include a narrative of the project operation, a determination of whether objectives were met, map of the area, photographs of the site, number of work hours, and final cost of the project.

#### **f. Annual Planned Project List**

Proposed projects may be submitted to the Park Fire Coordinator by any division chief. The Park Fire Coordinator will compile a list of these projects and submit them to the Superintendent for approval and prioritization.

### **F. Emergency Rehabilitation and Restoration**

On January 19, 2001, the Department of the Interior issued new policy on burned area emergency stabilization and rehabilitation. The specifics of the policy can be found in 620 DM 3 [DOI BAER Policy \(2001\)](#). The Park Fire Coordinator and the Natural Resource Specialist, subject to review by the Park Fire Committee, will jointly formulate a rehabilitation plan for each fire. The BAER plan will be submitted to the Regional BAER Coordinator (Regional Prescribed Fire Specialist) through the Area Fire Management Officer for approval within 72 hours of the date the fire is declared controlled. BAER project requests totaling \$300,000 or less can be approved by the Regional Baer Coordinator. Submissions over this amount are reviewed at the regional level and forwarded to the NPS Fire Management Program Center for approval.

## **V. ORGANIZATIONAL AND BUDGETARY PARAMETERS**

### **A. Organizational Structure**

At TICA, the Superintendent relies on the Chief Ranger (Park Resource Management Specialist) to supervise wildland fire management activities (Table 11). The Superintendent will instruct the Chief Ranger to develop adequate fire plans and training procedures that will include such personnel from the staff and employees at TICA as may be necessary for organization of suppression crews that will function in time of emergency.

The Chief Ranger will ensure suppression actions are taken on all wildland fires and will endeavor to assure control within the first burning period or day. The Park Superintendent and Chief Ranger will rely on any agreements with cooperating agencies for assistance needed for the suppression of any wildland fire.

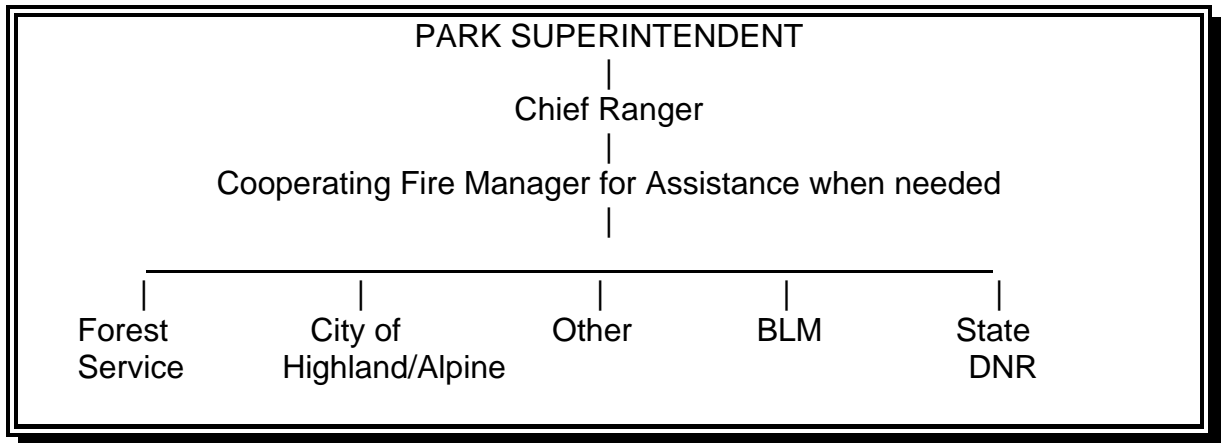
When TICA has insufficient resources and facilities to cope with the fire situation, the Park Superintendent will make available to the Chief Ranger, the personnel, equipment and other personnel to the extent necessary to meet suppression objectives. When assistance becomes necessary the Park Superintendent and/or Chief Ranger will also request the assistance of cooperators. This assistance will come through a formal request through the Northern Utah Interagency Fire Center.

If, despite the employment of all available local TICA and cooperating personnel, equipment and facilities, it is still impossible to effect control, the Superintendent and/or Chief Ranger will inform the Northern Utah Interagency Fire Center and request additional assistance from its cooperators.

**SUPERINTENDENT:** The superintendent has the primary responsibility for the protection of TICA from loss by fire and will designate the NPS personnel responsible for the preparation of plans covering, prevention, pre-suppression, discovery and suppression of wildland fires. This position is presently the Resources Management Specialist (Chief Ranger). The Superintendent will delegate any changes to this in writing during the fire season. The Superintendent will delegate authority for fire command duty via a signed Delegation of Authority to Incident Commanders (extended attack), as well as acting designations covering absences during the fire season.

**RESOURCE MANAGEMENT SPECIALIST:** The Resource Management Specialist (Chief Ranger) is directly responsible to the Park Superintendent for all fire management activities on the Park. He/she will assist NPS personnel or other fire management personnel or take charge of larger fires, as qualified to do so. He/she will monitor and oversee actions on all fires occurring on TICA. During complex, multi-incident situations, the Chief Ranger may represent the NPS as the Agency Representative if so designated by the Superintendent. These responsibilities shall require written delegations if the Chief Ranger is absent during the fire season.

**Table 11. TICA Fire Organization Chart.**



**ALL OTHER PERSONNEL:** All other NPS employees are expected to perform fire duty and assignments to which they are qualified. Consideration must also be given to the priority of other jobs in TICA. Consistent with efficient emergency suppression actions, first call will be made to personnel whose jobs will cause the least disruption to the Park.

**INCIDENT COMMANDER:** On a large fire this would normally be from the NPS or a cooperating agency outside TICA. The person performing these duties would be working under a Delegation of Authority signed by the Superintendent outlining the responsibilities for implementing the suppression activities.

**EMERGENCY FIREFIGHTER PERSONNEL:** A contingent of emergency wildland firefighters and fire support personnel may be trained and certified for assignments within the Northern Utah Interagency Fire Center Zone which would include TICA lands for wildland fire incidents or other emergency assistance as requested.

## **B. FIREPRO Funding**

FIREPRO funds are provided through the Department of Interior firefighting account, and are non-ONPS funds distributed to each Park by the Fire Program Management Center, through the WASO budget office.

All FIREPRO funding activities must comply with instructions prescribed in RM-18 and the FIREPRO User's Guide.

## **C. Fire Management Organization vs. Timpanogos Cave National Monument Organization**

Due to the limited number of personnel that work at TICA, all personnel have fire management duties (directly or indirectly). Some personnel will need to be responsible for more than one position and the responsibilities of those positions. Refer to Table 4 that shows the organization. The interagency "Red Book" outlines fire qualification requirements for fire duties. Non-Red-Carded individuals will not participate in operational duties of emergency fire suppression or prescribed burn ignition and holding. Support activities shall be at the orders of the Superintendent or designated representative, the Chief Ranger.

## **D. Park Superintendent Fire Responsibilities**

The superintendent has the primary responsibility for the protection of TICA from loss by fire and will designate the NPS personnel responsible for the preparation of plans covering, prevention, pre-suppression, discovery and suppression of wildland fires. The Chief Ranger is the designated TICA fire program lead.

## **E. Needed Agency and Interagency Coordination to implement FMP**

Northern Utah Interagency Fire Center – Wildland Fire Suppression, Prescribed Fire, Smoke Management

City of Alpine – Lone Peak Fire Department – Structural Fire Suppression

Uinta National Forest – UT – Fire Management Leadership, Initial Attack - Wildland Fire Suppression, Prescribed Fire

Pleasant Grove Ranger District – Pleasant Grove, UT – Initial Attack – Wildland Fire Suppression, Fire Management Leadership and Prescribed Fire  
State of Utah DNRC – Salt Lake City, UT – Initial Attack - Wildland Fire Suppression, Prescribed Fire  
Zion National Park (FMO) – Fire Management Leadership and Prescribed Fire

## **F. Key Interagency Contacts**

Northern Utah Interagency Fire Center  
Lone Peak Fire Department  
Utah County Sheriff  
Utah County Commissioners  
Pleasant Grove Ranger District  
Uinta National Forest  
Eastern Great Basin Coordinating Center

## **G. Fire Related Agreements**

Cities of Alpine and Highland – Structural Fire Suppression Agreement  
Uinta National Forest – Fire Management Agreement (**Appendix E**)  
Northern Utah Interagency Fire Center Operating Plan  
Eastern Great Basin Operating Plan  
Utah Smoke Management Plan (**Appendix F**)

# **VI. MONITORING**

## **A. Monitoring Requirements**

All NPS units applying wildland fire use and/or prescribed fire to accomplish resource benefits must prepare a Fire Monitoring Plan (RM-18). There are four monitoring levels; Level 1 and 2 are appropriate at the fire program level proposed by this plan.

## **B. TICA Wildland Fire and Prescribed Monitoring Plan**

The TICA **Wildland and Prescribed Fire Monitoring Plan** is consistent with protocols derived from the National Park Service Fire Monitoring Handbook (2003). Other monitoring methods may be used as Chief Ranger may deem necessary. The minimum monitoring for the purposes of documenting each prescribed burn are: Level 1- Environmental Conditions, and Level 2-Fire Observations. These are outlined below.

Level 1-Fire Conditions:

- Fire Monitoring Period – to be determined by the fire or resource manager,
- Topographic Variables,
- Predicted and Observed Fire Behavior,
- Smoke Characteristics and Observed Impacts,
- Fuel & Vegetation Types,
- Current and Forecasted Fire Weather

Level 2-Fire Observations:

- Fire Cause (ignition system),
- Fire Location (origin) and time,
- Fire Size,
- Fuel and Vegetation Description,
- Relative Fire Activity,
- Potential for Further Spread,
- Current and Forecasted Weather,
- Resource or Safety Threats and Constraints,
- Smoke Volume and Movement.

## **VII. FIRE RESEARCH**

Information regarding primary and secondary fire effects in most ecosystems is incomplete. This absence of information should not constrain fire program implementation. Rather, as new information becomes available fire related resource management objectives can be refined in an adaptive management style.

### **A. Previous and Ongoing Fire Research**

There are no previous or ongoing fire research projects at TICA.

### **B. Fire Research Needs and Opportunities**

Fire research funding is limited. However, if it is determined that significant information is needed concerning the effects of fire or fire exclusion, monument managers may submit requests through the annual FIREPRO budget call. Additionally, requests for research funding may be made through the Joint Fire Sciences Group.

As research opportunities become available, studies may be undertaken to determine effects of fire use within TICA on exotic weeds, water quality and flow rates, riparian vegetation, soil erosion rates, and wildlife habitat.

Implementation of the TICA FMP is not contingent on completion of research of the local fire regime and fire effects on vegetation. A body of scientific information already exists regarding effects of fire and fire exclusion for the plant associations of TICA. Although this research was accomplished in other geographic areas, the results may be applied to TICA (taking care to identify site differences and any subtle differences in effects that those differences might cause).

## **VIII. PUBLIC SAFETY**

Managing a wildland fire program is one of the highest risk operations that a land management agency accomplishes. The first priority in any fire management action is firefighter and public safety.

Safety related issues in fire management are those of endangering humans to high rates of spread and high fire intensities that can occur in a normal fire season. There are several programs that concentrate on mitigating public and firefighter safety; fire prevention (fire hazard awareness and preparedness), prescribed fire (treatment of high fire risk areas with fire, thus increasing firefighter and public safety), fuel hazard reduction (using mechanical treatments to reduce hazardous fuels), etc. High-risk areas where the public or wildland firefighters are at risk need to be identified with planning for reducing the hazards.

#### **A. Public Safety Issues and Concerns**

The following is a list of public safety issues and concerns that are important to the TICA:

- Monument Visitor Safety in and around the cave, cave trail, as well as, the facilities.
- Monument Visitor Safety in areas away from the cave and the facilities.
- Highway traffic on Utah Highway 92 running through TICA with relation to smoke impacts, or fire impingements, snags, etc.
- Protection of the wildlife in and surrounding TICA.
- Unknown TICA visitors that come on monument property from adjacent Forest Service lands unannounced.
- Occupied residences

#### **B. Public Safety Measures**

- Public safety concerns will be specifically addressed in each Wildland Fire Situation Analysis (WFSA), and Prescribed Fire Plan. The following public safety measures will be taken:
- Public safety and fire danger messages should be developed as required and incorporated into the process of fire information dissemination.
- Trails and unimproved roads in the vicinity of wildland fires, and prescribed fires will be closed if potentially hazardous conditions are present.
- Traffic control measures, including smoke warning signs, flashing signal lights, traffic cones, and either fire or law enforcement personnel should be situated on roads where smoke intrusion incidents are anticipated to occur.
- To keep spectators at a safe distance from prescribed fires. Patrols will be assigned to each prescribed fire.
- Notification of local and adjacent landowners.

#### **C. Firefighter Safety Issues and Concerns:**

- Meeting appropriate fire qualifications.
- Equipped with proper PPE.
- Pass physical fitness standards relative to position assigned on a fire.
- Attend training in order to qualify personnel for position assigned to a fire.
- Entrapment, fatalities and/or serious injuries.
- Safety standards and guidelines will be followed.

- Job Hazard Analyses will be completed and used for all jobs.
- Safety meetings will be conducted and documented.
- Accident reviews will be conducted, completed and corrective actions taken.
- Aviation safety.

#### **D. Firefighter Safety Measures**

The following program requirements will be followed at TICA to mitigate safety concerns/issues above.

- All fire personnel shall meet appropriate qualifications, including medical requirements, for all fire assignments (as per RM-18 and DO-18).
- Fire personnel shall be equipped with personal protective equipment appropriate to their incident assignments.
- All fire personnel and cooperators will comply with NWCG and NPS fitness and personal protective equipment standards while assigned to fire incidents except for initial action by mutual aid cooperators.
- Fire Personnel assigned to fireline operations will complete a minimum of 32 hours of basic wildland fire training, and then annually a minimum of 16 hours of refresher (FFT1 and above), 8 hours refresher for FFT2, and safety training prior to incident assignments.
- All wildland fire incidents which result in human entrapment, fatalities, or serious injuries, or result in incidents with potential for the above, will be reported and investigated (reference DO #18).
- All safety standards and guidelines identified within the Interagency Incident Business Management Handbook and NUIFC guidelines will be followed.
- Management of all wildland fire incidents will comply with interagency risk management standards.
- The Job Hazard Analysis (JHA) will be used for projects which present potential hazardous activities and for jobs which require employee use of out-of-the-ordinary personal protective equipment (PPE); refer to RM-18 for JHA process and format.
- Documented Safety meetings will be conducted as needed under the supervision of the Suppression Manager.
- Accidents will be reviewed to determine areas needing improvement, not as punitive measures; normally held between the supervisor and employee.
- All safety protocols (RM-60) for the aviation program is fully used for NPS helicopter operations.

### **IX. PUBLIC INFORMATION AND EDUCATION**

#### **A. Information**

It is beneficial to the fire management program to keep the public well informed on the current events. Prior to fire season public information regarding fire prevention, mechanical fuels reduction projects, burning permits, potential fire danger, training,

cooperator involvement, etc. During the fire season it may become necessary to inform the local residents of the current fire danger, current fire activity, any fire restrictions, road/trail closures, etc.

At the end of each fire season TICA in conjunction with the Uinta National Forest may put out a “Thank You” for their help with the reduction in person caused fires and include what you did experience and what you did accomplish. (i.e., how many fires on TICA, number of firefighters you had to bring in, number of firefighters you sent some place to help others, amount of acres prescribed burned and for what reasons.)

Any requests for information, emanating from the print or broadcast media, concerning wildland fire incidents will be referred to the Superintendent or other public information personnel as appointed by the Superintendent. The occurrence of a wildland fire within a National Park Service unit often arouses media attention. All reasonable efforts will be made to allow for media access so long as public safety or that of firefighting personnel is not compromised.

Any wildland fire management activity will be promptly reported to NPS through the “Firenews website.” The reporting information will continue until the FMO has determined that the fire is out or that the treatment has been completed. Updated to this website should only be submitted when there is a change in fire or treatment activity.

Prior to implementing joint fire use projects with the Forest Service, messages tailored to local audiences will be developed to promote understanding of fire use and its benefits in managing hazardous fuels and assisting in protection of historic resources.

## **B. Education**

It is necessary to include an education effort as a part of the fire prevention program. Education may also be necessary if there is a planned fire prevention or fuel project that may have outspoken critics.

An integral part of public education is the dispersion of current fire danger information through signs illustrating current fire danger, press releases, and other public announcements. It is important that the residents are made aware of current fire danger levels, and if signs are utilized they should be updated on a regular basis. Raising the public awareness on both of the subjects of fire management and fire suppression may provide benefits in reducing arson caused fires and increased public cooperation with fire related law enforcement.

Other programs that can be incorporated into the TICA that relate to Public Information and Education are:

- Incorporate the principles of fire's role in the ecosystems surrounding TICA and the importance of fire as a resource management tool into any interpretive programs, exhibits, videos, interpretive trails through the Park, brochures, civic group presentations, school presentations, etc.
- Educate Park personnel on the nature, value and objectives of the fire program.

- Forward all fire-related press releases to the Park Superintendent and keep all NPS personnel informed.
- Develop and/or assist other wildland fire protection agencies with public information programs that promote the benefits of “Firewise” community planning, defensible space, mechanical fuel reduction, etc.
- Establish rapport with local press and media representatives and accommodate all interview requests that will benefit TICA by promoting the fire program.
- Educate the public on the responsible use of fire in the monument picnic grounds.

## **X. PROTECTION OF SENSITIVE RESOURCES**

### **A. Cultural Resource Sites**

1. An archaeological survey has been completed at Timpanogos Cave according to Executive Order 11593. The one site found. A single Fremont rock art does not meet the criteria for nomination to the National Register of Historic Places. The location is near a structure and therefore will be protected from fire along with the structure.

A List of Classified Structures Inventory was carried out in November 1975. A national Register nomination for the Timpanogos Cave Historical District was placed on the Register in 1982 and includes: Residence #8, Bridge, Comfort Station Building #126 (bath house), Comfort Station Building 127 (cave area restrooms), two cold cellars, the stone storage building, and the Timpanogos Cave Trail. All of these structures except the Cave trail and Comfort Station #127 are located in the park residential and maintenance area. (**Appendix E**)

2. Areas where ground disturbance activities are planned will be assessed by a cultural resource specialist and Sec. 106 compliance completed prior to initiation of such action. Any suspected archeological or cultural sites inadvertently discovered during wildland fire operations will be protected and preserved and all sites will be reported to Park Managers.

3. Suppression operations are generally considered emergencies exempt from Sec. 106 requirements. The park Chief Ranger will function as the Resources Advisor to the IC during fire activity to provide data and information regarding known features and other values to be protected during and following suppression operations.

### **B. Protection of Sensitive Natural Resources**

There are no federally listed endangered species, or species of special concern known to occur at TICA.

### **C. Modern Infrastructure and Developments**

Urban-interface mitigation techniques for eliminating and/or reducing potential wildland fire fuel hazards should be applied to prevent or reduce negative impacts to both historic and modern developments within the boundaries of TICA. FIREWISE standards have been adopted as the national standard by the National Park Service; they should be applied to areas around park development to help reduce the risk from wildland fires. Private development does not exist adjacent to TICA.

## **XI. FIRE CRITIQUES AND ANNUAL PLAN REVIEWS**

All Wildland Fire Management Plans are required to be reviewed annually with updates approved by the Superintendent. Copies of the signed updates should be sent to Zion National Park and the Regional Fire Management Officers on a yearly basis. Verification forms signed by the Superintendent are required for all proposed fuels treatment projects that are funded with National Fire Plan funding.

### **A. Fire Review**

A documented fire review is required after each wildland fire event. The after action review should identify what went right and where improvement is needed. The review is to identify areas that can be improved upon through training, change in procedure, improved communication, etc. Special recognition should be given to those that put forward extra effort to accomplish their duties and help meet the goals and objectives of the incident. Also any cooperators should be recognized. Any changes in procedure(s) should be made immediately and disseminated to all those that may be involved. Training deficiency should be corrected as soon as required training is available.

### **B. Annual Fire Summary Report**

The Chief Ranger will be responsible for completing an annual Wildland Fire Summary Report, if applicable because fires have occurred. The report will contain the number of fires by type, acres burned by fuel type, cost summary, personnel utilized, hours of aircraft used, and fire effects. Copies will be sent to Zion National Park and the RFMO.

### **C. Annual Wildland Fire Management Plan Review**

The Wildland Fire Management Plan will be reviewed annually by the Park Superintendent and the Chief Ranger. Necessary updates or changes will be accomplished prior to the next fire season. Any additions, deletions, or changes will be reviewed by the Chief Ranger to determine if such alterations require a new NEPA process. Major changes should be discussed with Zion FMO. The Superintendent's signature on the updates serves as a revalidation of the plan. Copies will be sent to Zion FMO and the RFMO. Since the adjacent agency, the USFS plays a significant role in TICA FMP implementation and operations, they should be consulted when considering any significant plan revisions.

## **XII. CONSULTATION AND CORDINATION**

### **A. Wildland Fire Management Plan, Agencies consulted**

Intermountain Regional Office, National Park Service  
Zion National Park  
Uinta National Forest  
Northern Utah Interagency Fire Center  
Pleasant Grove Ranger District  
Utah Fish & Wildlife Division  
Utah SHPO

### **B. Wildland Fire Management Plan, Persons consulted**

1. Uinta Fire Dispatch (801) 377-5780
2. Agency Assistance
  - a. Zion National Park  
Jan Passek, Fire Management Officer (435) 772-0188  
Henry Bastian, Fire Program Assistant (435) 772-0189
  - b. Intermountain Regional Office  
Bryan Swift, Fire Management Officer (303) 969-2449
3. U.S. Forest Service  
Pleasant Grove Office - Reed Shelley (801) 785-3563
4. Eastern Great Basin Coordination Center  
Manager - Greg Zschaechner (801) 531-5322
5. Sheriff's Communication Center (801) 375-3601
6. American Fork Hospital 911 or  
(801) 763-3300

### **B. Wildland Fire Management Plan Preparation**

Michael Gosse, Chief Ranger, Timpanogos Cave National Monument

Bridgett Dart, Biological Science Technician, Timpanogos Cave National Monument

Jan Passek, Fire Management Officer, Zion National Park, National Park Service

Brock LeBaron, Technical Analysis Section, Division of Air Quality, State of Utah  
Department of Environmental Quality

Chuck Wetlander, Fire Planner, Uinta National Forest, US Forest Service

### **XIII. APPENDICES**

#### **Appendix A**

#### **REFERENCES CITED**

DO 12, NEPA

DO 18, The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide, (1998). And attendant Reference Manual (RM-18).

Federal Wildland Fire Management Policy and Program Review

National Park Service, Organic Act, August 25, 1916

National Park Service, Public Law Number 1640, establishing Timpanogos Cave National Monument

## **Appendix B**

### **Definition of Terms**

**Chain:** A unit of measure equal to 66 feet.

**Control Line:** A comprehensive term for all the constructed and natural fire barriers and treated fire edges used to control a fire.

**Direct Method:** A method of suppression that treats the fire as a whole, or all its burning edges, by wetting, cooling, smothering, or chemically quenching the fire, or by mechanically separating the fire from unburned fuel.

**Fire Weather:** Weather conditions which influence fire ignition, behavior, and suppression.

**Fire Management Plan:** A strategic plan that defines a program to manage wildland fires. This plan is supplemented by operational procedures such as preparedness, preplanned dispatch burn plans and prevention.

**Flame Length (FL):** The length of a flame measured from the base of the flame to its tip and parallel to the length of the flame. Flame length is measured on a slant when the flame is tilted due to the effects of wind and slope.

**Fuel Model:** A simulated fuel complex for which all fuel descriptions required by the mathematical fire spread model have been specified.

**Fuel Type:** An identifiable vegetative association of fuel elements of distinctive species, form, size, arrangement, or other characteristics.

**Hazard Fuels:** Fuels that, if ignited, have significant potential to threaten human life and safety, real property, park resources, or carry fire across park boundaries.

**Indirect Attack:** A method of suppression in which the control line is located along natural firebreaks, favorable breaks in topography, or at considerable distance from the fire.

**Initial Action:** Action taken by the first resources to arrive at a wildland fire to meet protection and fire use objectives.

**Minimum Impact Suppression Tactics (MIST):** The application of techniques that effectively accomplish wildland fire management objectives while minimizing the impacts to cultural and natural resources commensurate with ensuring public and firefighter safety and effective wildland fire control.

**National Fire Danger Rating System (NFDRS):** A multiple index scheme designed to provide fire control and land management personnel with a systematic means of assessing various aspects of fire danger on a day-to-day basis.

**Planned Ignition:** A fire ignited by management actions to meet specific objectives.

**Preparedness:** Activities that help to provide a safe, efficient and cost effective fire management program in support of land and resource management objectives through appropriate planning and coordination.

**Prescribed Fire:** A fire ignited by park managers under known conditions of fuel, weather, and topography to achieve specific objectives. An approved prescribed fire plan must be completed and NEPA requirements must be met prior to ignition.

**Prescription:** Measurable criteria that guide selection of appropriate management strategies and actions. Prescription criteria may include economic, public health, environmental, geographic, administrative, social or legal considerations.

**Rate of Spread (ROS):** The time it takes the leading edge of a flaming fire front to travel a known distance. Rate of spread is commonly measured in chains/hour and meters/second.

**Suppression:** management actions intended to protect identified values from a fire, extinguish a fire, or alter a fire's direction of spread.

**Unplanned Ignition:** A wildland fire not ignited by management actions.

**Wildland:** Any area under fire management jurisdiction of a land management agency.

**Wildland Fire:** Any fire, other than prescribed fire that occurs in the wildland.

**Wildland Fire Situation Analysis (WFSA):** A decision-making process that evaluates alternative management strategies against selected environmental, social, political, and economic criteria.

**Weather Information Management System (WIMS):** An interactive computer system designed to accommodate the weather information needs of all federal and state natural resource agencies.

**Appendix C**  
**Species Lists**

**Timpanogos Cave National Monument**

**Mammal Checklist-2002**

**Order INSECTIVORA**

**Family SORICIDAE**

<i>Sorex cinereus</i>	Masked shrew
<i>Sorex merriami</i>	Merriam's shrew
<i>Sorex monticolus</i>	Montane shrew
<i>Sorex nanus</i>	Dwarf shrew
<i>Sorex preblei</i>	Preble's shrew
<i>Sorex vagrans</i>	Vagrant shrew

**Order CHIROPTERA**

**Family VESPERTILIONIDAE** (Plainnose bats)

<i>Myotis ciliolabrum</i>	Western small-footed bat
<i>Myotis evotis</i>	Long-eared myotis
<i>Myotis lucifugus</i>	Little brown bat
<i>Myotis thysanodes</i>	Fringed myotis
<i>Myotis volans</i>	Long-legged myotis
<i>Myotis yumanensis</i>	Yuma myotis
<i>Lasiurus cinereus</i>	Hoary bat
<i>Lasionycteris noctivagans</i>	Silver-haired bat
<i>Eptesicus fuscus</i>	Big brown bat
<i>Euderma maculatum</i>	Spotted bat
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat

**Family MOLOSSIDAE**

<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat
<i>Nyctinomops macrotis</i>	Big free-tailed bat

**Order LAGOMORPHA**

**Family LEPORIDAE**

<i>Sylvilagus nuttallii</i>	Nuttall's cottontail
<i>Lepus americanus</i>	Snowshoe hare
<i>Lepus townsendii</i>	White-tailed jack rabbit

**Order RODENTIA**

**Family SCIURIDAE**

<i>Tamias dorsalis</i>	Cliff chipmunk
<i>Tamias minimus</i>	Least chipmunk
<i>Tamias umbrinus</i>	Uinta chipmunk
<i>Marmota flaviventris</i>	Yellow-bellied marmot
<i>Spermophilus lateralis</i>	Golden-mantled ground squirrel
<i>Spermophilus variegatus</i>	Rock squirrel
<i>Tamiasciurus hudsonicus</i>	Red squirrel
<i>Glaucomys sabrinus</i>	Northern flying squirrel

**Family GEOMYIDAE**

*Timpanogos Cave National Monument – Fire Management Plan*

<i>Thomomys talpoides</i>	Northern pocket gopher
<b>Family CASTORIDAE</b>	
<i>Castor canadensis</i>	Beaver
<b>Family MURIDAE</b>	
<i>Reithrodontomys megalotis</i>	Western harvest mouse
<i>Peromyscus boylii</i>	Brush mouse
<i>Peromyscus maniculatus</i>	Deer mouse
<i>Neotoma cinerea</i>	Bushy-tailed woodrat
<i>Microtus longicaudus</i>	Long-tailed vole
<i>Microtus montanus</i>	Montane vole
<i>Microtus pennsylvanicus</i>	Meadow vole
<b>Family DIPODIDAE</b>	
<i>Zapus princeps</i>	Western jumping mouse
<b>Family ERETHIZONTIDA</b>	
<i>Erethizon dorsatum</i>	North American porcupine
<b>Order CARNIVORA</b>	
<b>Family CANIDAE</b>	
<i>Canis latrans</i>	Coyote
<i>Vulpes vulpes</i>	Red fox
<i>Urocyon cinereoargenteus</i>	Gray fox
<b>Family URSIDAE</b>	
<i>Ursus americana</i>	American black bear
<b>Family PROCYONIDAE</b>	
<i>Bassariscus astutus</i>	Ringtail Cat
<i>Procyon lotor</i>	Raccoon
<b>Family MUSTELIDAE</b>	
<i>Mustela erminea</i>	Ermine
<i>Mustela frenata</i>	Long-tailed weasel
<i>Mustela vison</i>	Mink
<i>Spilogale gracilis</i>	Western spotted skunk
<i>Mephitis mephitis</i>	striped skunk
<b>Family FELIDAE</b>	
<i>Puma concolor</i>	Mountain lion
<i>Felis rufus</i>	Bobcat
<b>Order ARTIODACTYLA</b>	
<b>Family CERVIDAE</b>	
<i>Cervus elaphus</i>	North American Elk
<i>Odocoileus hemionus</i>	Mule deer
<i>Alces alces</i>	Moose
<b>Family BOVIDAE</b>	
<i>Oreamnos americanus</i>	Rocky Mountain goat
<i>Ovis Canadensis</i>	Big-horned sheep

## Bird Checklist-2002

### Order ANSERIFORMES

#### Family ANATIDAE

*Anas carolinensis*  
*Anas platyrhynchos*  
*Aythya valisineria*  
*Branta canadensis*  
*Bucephala clangula*  
*Mergus merganser*

#### GEESE & DUCKS

Green-winged Teal  
Mallard  
Canvasback  
Canada Goose  
Common Goldeneye  
Common Merganser

### Order CHARADRIIFORMES

#### Family CHARADRIIDAE

*Charadrius vociferus*

#### Family SCOLOPACIDAE

*Numenius americanus*

#### PLOVERS, TURNSTONES, SURFBIRDS

Killdeer

#### SNIFE, SANDPIPERS

Long-billed Curlew

### Order FALCONIFORMES

#### Family ACCIPITRIDAE

*Accipiter cooperii*  
*Accipiter gentilis*  
*Accipiter striatus*  
*Aquila chrysaetos*  
*Buteo jamaicensis*  
*Buteo regalis*  
*Falco columbarius*  
*Falco mexicanus*  
*Falco sparverius*  
*Haliaeetus leucocephalus*

#### HAWKS, KITES, HARRIERS, EAGLES

Cooper's Hawk  
Goshawk  
Sharp-shinned Hawk  
Golden Eagle  
Red-tailed Hawk  
Ferruginous Hawk  
Pigeon Hawk  
Prairie Falcon  
Sparrow Hawk  
Bald Eagle

#### Family CATHARTIDAE

*Cathartes aura*

#### AMERICAN VULTURES

Turkey Vulture

### Order GALLIFORMES

#### Family TETRAONIDAE

*Dendragapus obscurus*  
*Bonasa umbellus*

#### GROUSE & PTARMIGANS

Blue Grouse  
Ruffed Grouse

### Order PASSERIFORMES

#### Family ACTERIDAE

*Agelaius phoeniceus*  
*Hturnella neglecta*  
*Icterus bullocki*

#### MEADOWLARKS, BLACKBIRDS, ORIOLES

Redwinged Blackbird  
Western Meadowlark  
Bullock's Oriole

#### Family ALAUDIDAE

*Eremophila alpestris*

#### LARKS

Horned Lark

#### Family ALCEDINIDAE

*Megasceryle alcyon*

#### KINGFISHERS

Belted Kingfisher

#### Family APODIDAE

*Aeronautes saxatalis*

#### SWIFTS

White-throated Swift

#### Family CAPRIMULGIDAE

*Chordeiles minor*

#### GOATSUCKERS

Common Nighthawk

*Timpanogos Cave National Monument – Fire Management Plan*

<i>Phalaenoptilus nuttallii</i>	Poor-will
<b>Family CERTHIIDAE</b>	<b>CREEPERS</b>
<i>Certhia familiaris</i>	Brown Creeper
<b>Family CINCLIDAE</b>	<b>DIPPERS</b>
<i>Cinclus mexicanus</i>	Dipper
<b>Family COLUMBIDAE</b>	<b>PIGEONS &amp; DOVES</b>
<i>Zenaidura macroura</i>	Mourning Dove
<b>Family CORVIDAE</b>	<b>JAYS, MAGPIES, CROWS</b>
<i>Cyanocitta stelleri</i>	Steller's Jay
<i>Gymnorhinus cyanocephala</i>	Pinyon Jay
<i>Nucifraga columbiana</i>	Clark's Nutcracker
<i>Perisoreus canadensis</i>	Gray Jay
<i>Pica pica</i>	Black-billed Magpie
<b>Family BOMBYCILLIDAE</b>	<b>WAXWINGS</b>
<i>Bombycilla cedorum</i>	Cedar Waxwing
<i>Hombycilla garrula</i>	Bohemian Waxwing
<i>Lanius ludovicianus</i>	Loggerhead Shrike
<b>Family FRINGILLIDAE</b>	<b>GROSBEAKS, FINCHES, SPARROWS, BUNTINGS</b>
<i>Acanthis flammea</i>	Common Redpoll
<i>Amphispiza belli</i>	Sage Sparrow
<i>Carpodacus cassinii</i>	Cassin's Finch
<i>Carpodacus mexicanus</i>	House Finch
<i>Chondestes grammacus</i>	Lark Sparrow
<i>Hesperiphona vespertina</i>	Evening Grosbeak
<i>Junco caniceps</i>	Gray-headed Junco
<i>Junco hyemalis</i>	Slate-colored Junco
<i>Junco oreganus</i>	Oregon Junco
<i>Leucosticte atrata</i>	Black Rosy Finch
<i>Leucosticte tephrocotis</i>	Gray-crowned Rosy Finch
<i>Loxia curvirostra</i>	Red Crossbill
<i>Passerella iliaca</i>	Fox Sparrow
<i>Passerina amoena</i>	Lazuli Bunting
<i>Petrophenax nivalis</i>	Snow Bunting
<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak
<i>Pinicola enucleator</i>	Pine Grosbeak
<i>Pipilo erythrophthalmus</i>	Rufous-sided Towhee
<i>Poecetes gramineus</i>	Vesper Sparrow
<i>Spinus pinus</i>	Pine Siskin
<i>Spizella arborea</i>	Tree Sparrow
<i>Zonotrichia leucophrys</i>	White-crowned Sparrow
<i>Zonotrichia passerine</i>	Chipping Sparrow
<b>Family HIRUNDINIDAE</b>	<b>SWALLOWS</b>
<i>Iridoprocne bicolor</i>	Tree Swallow
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow
<i>Progne subis</i>	Purple Martin
<i>Tachycineta thalassina</i>	Violet-green Swallow
<b>Family LARIDAE</b>	<b>GULLS &amp; TERNS</b>
<i>Larus californicus</i>	California Gull

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<i>Larus delawarensis</i>	Ring-billed Gull
<b>Family MIMIDAE</b>	<b>MOCKINGBIRDS &amp; THRASHERS</b>
<i>Dumetella carolinensis</i>	Catbird
<i>Mimus polyglottos</i>	Mockingbird
<i>Oreoscoptes montanus</i>	Sage Thrasher
<b>Family PARIDAE</b>	<b>TITMICE, VERDINS, BUSHTITS</b>
<i>Parus atricapillus</i>	Black-capped Chickadee
<i>Parus gambeli</i>	Mountain Chickadee
<b>Family PARULIDAE</b>	<b>WOOD WARBLERS</b>
<i>Dendroica auduboni</i>	Audubon's Warbler
<i>Dendroica nigrescens</i>	Black-throated Gray Warbler
<i>Dendroica petechin</i>	Yellow Warbler
<i>Icteria virens</i>	Yellow-breasted Chat
<i>Oporornis tolmiei</i>	MacGillivray's Warbler
<i>Vermivora ruficapilla</i>	Nashville Warbler
<i>Vermivora virginiae</i>	Virginia's Warbler
<i>Vermivora celata</i>	Orange-crowned Warbler
<i>Wilsonia pusilla</i>	Wilson's Warbler
<b>Family PICIDAE</b>	<b>WOODPECKERS</b>
<i>Asyndesmus lewis</i>	Lewis' Woodpecker
<i>Colaptes cafer</i>	Red-shafted Flicker
<i>Dendrocopos scalaris</i>	Downy Woodpecker
<i>Dendrocopos villosus</i>	Hairy Woodpecker
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker
<i>Picoides tridactylus</i>	Northern 3-toed Woodpecker
<i>Sphyrapicus thyroideus</i>	Williamson's Sapsucker
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker
<b>Family PLOCEIDAE</b>	<b>WEAVER FINCHES</b>
<i>Passer domesticus</i>	House Sparrow
<b>Family SITTIDAE</b>	<b>NUTHATCHES</b>
<i>Sitta canadensis</i>	Red-breasted Nuthatch
<i>Sitta carolinensis</i>	White-breasted Nuthatch
<i>Sitta pygmaea</i>	Pygmy Nuthatch
<b>Family STRIGIDAE</b>	<b>OWLS</b>
<i>Asio otus</i>	Long-eared Owl
<i>Bubo virginianus</i>	Great Horned Owl
<i>Glaucidium gnoma</i>	Pygmy Owl
<i>Otus flammeolus</i>	Flammulated Owl
<b>Family SYLVIIDAE</b>	<b>GNATCATCHERS, KINGLETS, OLD WORLD WARBLERS</b>
<i>Regulus calendula</i>	Ruby-crowned Kinglet
<i>Regulus satrapa</i>	Golden-crowned Kinglet
<b>Family THRAUPIDAE</b>	<b>TANAGERS</b>
<i>Piranga ludoviciana</i>	Western Tanager
<b>Family TROCHILIDAE</b>	<b>HUMMINGBIRDS</b>
<i>Archilocus alexandri</i>	Black-chinned Hummingbird
<i>Selasphorus platycercus</i>	Broad-tailed Hummingbird
<i>Selasphorus rufus</i>	Rufous Hummingbird

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**Family TROGLODYTIDAE**

*Catherpes mexicanus*  
*Salpinctes obsoletus*  
*Troglodytes aedon*

**Family TURDIDAE**

*Hylocichla guttata*  
*Hylocichla ustulata*  
*Sialia currucoides*  
*Sialia mexicana*  
*Turdus migratorius*

**Family TYRANNIDAE**

*Contopus sordidulus*  
*Empidonax difficilis*  
*Empidonax trailii*  
*Myiarchus cinerascens*  
*Nuttallornis borealis*  
*Sayornis saya*  
*Tyrannus tyrannus*  
*Tyrannus verticalis*

**Family VIREONIDAE**

*Vireo atricapilla*  
*Vireo gilvus*  
*Vireo olivaceus*

**WRENS**

Canyon Wren  
Rock Wren  
House Wren

**THRUSHES, BLUEBIRDS,  
SOLITAIRES**

Hermit Thrush  
Swainson's Thrush  
Mountain Bluebird  
Western Bluebird  
Robin

**TYRANT FLYCATCHERS**

Western Wood Pewee  
Western Flycatcher  
Traill's Flycatcher  
Ash-throated Flycatcher  
Olive-sided Flycatcher  
Say's Phoebe  
Eastern Kingbird  
Western Kingbird

**VIREOS**

Black-capped Vireo  
Warbling Vireo  
Red-eyed Vireo

## Vascular Flora List

### (From NPFLORA for Timpanogos Cave National Monument)

ITIS Scientific Name	ITIS Common Name
<a href="#"><i>Abies concolor</i></a>	balsam fir, colorado fir, concolor fir, silver fir, white balsam, white fir
<a href="#"><i>Abies lasiocarpa</i></a>	balsam fir, rocky mountain fir, subalpine fir, western balsam fir, white balsam
<a href="#"><i>Acer glabrum</i></a>	Rocky Mountain maple, california mountain maple, douglas maple, dwarf maple, mountain maple, new mexico maple, rocky mountain maple, sierra maple
<a href="#"><i>Acer grandidentatum</i></a>	bigtooth maple, canyon maple, sugar maple, uvalde big-tooth maple
<a href="#"><i>Acer negundo</i></a>	ashleaf maple, box elder, boxelder, boxelder maple, california boxelder, manitoba maple, western boxelder
<a href="#"><i>Achnatherum hymenoides</i></a>	Indian ricegrass
<a href="#"><i>Aconitum columbianum</i></a>	Columbia monkshood, Columbian monkshood, monkshood (columbian)
<a href="#"><i>Actaea rubra arguta</i></a>	red baneberry
<a href="#"><i>Agastache urticifolia</i></a>	horsemint giant hyssop, nettleleaf giant hyssop
<a href="#"><i>Agoseris glauca</i></a>	pale agoseris, pale dandelion, pale dandelion, prairie dandelion
<a href="#"><i>Alcea rosea</i></a>	Hollyhock
<a href="#"><i>Ambrosia</i></a>	bursage, ragweed, ragweed species
<a href="#"><i>Androsace septentrionalis</i></a>	northern rockjasmine, pygmy-flower rock-jasmine, pygmyflower rockjasmine
<a href="#"><i>Anemone multifida</i></a>	Pacific anemone
<a href="#"><i>Antennaria alpina</i></a>	alpine pussytoes
<a href="#"><i>Antennaria microphylla</i></a>	Rocky Mountain pussytoes, littleleaf pussytoes, small leaf everlasting, smallleaf pussytoes
<a href="#"><i>Antennaria parvifolia</i></a>	Rocky Mountain pussytoes, little-leaf pussytoes, small leaf pussytoes, small-leaf pussytoes, smallleaf pussytoes, smallleaf pussytoes
<a href="#"><i>Antennaria rosea</i></a>	rose pussytoes, rosy pussytoes
<a href="#"><i>Apocynum androsaemifolium</i></a>	bitterroot, flytrap dogbane, spreading dogbane
<a href="#"><i>Arctium minus</i></a>	bardane, beggar's button, burdock, common burdock, lesser burdock, lesser burdock, small burdock, smaller burdock, wild burdock, wild rhubarb
<a href="#"><i>Arenaria</i></a>	Sandwort
<a href="#"><i>Arnica cordifolia</i></a>	heart-leaf leopardbane, heartleaf arnica
<a href="#"><i>Arnica longifolia</i></a>	longleaf arnica, spearleaf arnica
<a href="#"><i>Arnica mollis</i></a>	hairy arnica, wooly arnica
<a href="#"><i>Arnica rydbergii</i></a>	Rydberg arnica, Rydberg's arnica, subalpine arnica
<a href="#"><i>Arnica sororia</i></a>	twin arnica
<a href="#"><i>Artemisia dracunculus</i></a>	false tarragon, green sagewort, silky wormwood, tarragon, wormwood
<a href="#"><i>Artemisia ludoviciana</i></a>	Louisiana sagewort, Louisiana wormwood, cudweed sagewort, gray sagewort, mugwort wormwood, prairie sage, white sagebrush
<a href="#"><i>Artemisia tridentata</i></a>	big sagebrush, big sagebush
<a href="#"><i>Asclepias speciosa</i></a>	showy milkweed
<a href="#"><i>Aspidotis densa</i></a>	Indian's dream, pod fern
<a href="#"><i>Asplenium trichomanes</i></a>	maidenhair spleenwort

<a href="#"><u>Asplenium trichomanes-ramosum</u></a>	brightgreen spleenwort, green spleenwort
<a href="#"><u>Astragalus</u></a>	astragalus spp., locoweed, locoweed species, milkvetch
<a href="#"><u>Astragalus beckwithii</u></a>	Beckwith's milkvetch
<a href="#"><u>Astragalus canadensis</u></a>	Canada milkvetch, Canadian milk-vetch, Canadian milkvetch
<a href="#"><u>Astragalus cibarius</u></a>	browse milkvetch
<a href="#"><u>Astragalus utahensis</u></a>	Utah locoweed, Utah milkvetch
<a href="#"><u>Betula occidentalis</u></a>	water birch
<a href="#"><u>Brickellia californica</u></a>	California brickellbush
<a href="#"><u>Brickellia grandiflora</u></a>	mountain brickellbush, tasselflower brickellbush, tasselflower brickellia
<a href="#"><u>Bromus inermis</u></a>	awnless brome, smooth brome
<a href="#"><u>Calamagrostis canadensis</u></a>	bluejoint, bluejoint reedgrass
<a href="#"><u>Calamagrostis scopulorum</u></a>	Jones reedgrass, ditch reedgrass
<a href="#"><u>Calamagrostis stricta inexpansa</u></a>	northern reedgrass, slim-stem reed grass
<a href="#"><u>Calochortus nuttallii</u></a>	sego lily, sego-lily
<a href="#"><u>Campanula latifolia</u></a>	giant bellflower
<a href="#"><u>Carex albonigra</u></a>	black-and-white sedge, blackandwhite sedge
<a href="#"><u>Carex atratiformis</u></a>	black sedge, scrabrous black sedge
<a href="#"><u>Carex aurea</u></a>	golden sedge, golden-fruit sedge
<a href="#"><u>Carex breweri</u></a>	Brewer's sedge
<a href="#"><u>Carex brunnescens</u></a>	brownish sedge
<a href="#"><u>Carex canescens</u></a>	silver sedge, silvery sedge
<a href="#"><u>Castilleja applegatei</u></a>	pine Indian paintbrush, wavyleaf Indian paintbrush, wavyleaf paintbrush
<a href="#"><u>Castilleja applegatei martinii</u></a>	Martin's paintbrush, desert Indian paintbrush, wavyleaf Indian paintbrush
<a href="#"><u>Castilleja linariifolia</u></a>	Wyoming Indian paintbrush, Wyoming paintbrush
<a href="#"><u>Castilleja miniata miniata</u></a>	giant red Indian paintbrush
<a href="#"><u>Castilleja rhexiifolia</u></a>	rhexialeaf paintbrush, splitleaf Indian paintbrush
<a href="#"><u>Castilleja sulphurea</u></a>	sulphur Indian paintbrush, sulphur Indianpaintbrush
<a href="#"><u>Catabrosa aquatica</u></a>	brookgrass, water whorl grass, water whorlgrass
<a href="#"><u>Chaenactis douglasii</u></a>	Douglas dustymaiden, Douglas' dustymaiden, Douglas' pincushion, dusty maiden, dusty-maiden
<a href="#"><u>Chaenactis douglasii alpina</u></a>	alpine dustymaiden
<a href="#"><u>Chaetopappa ericoides</u></a>	rose heath, smallflower aster
<a href="#"><u>Chrysothamnus viscidiflorus</u></a>	Douglas rabbitbrush, Douglas' rabbitbrush, green rabbitbrush, yellow rabbitbrush
<a href="#"><u>Cinna latifolia</u></a>	drooping woodreed, slender wood-reed
<a href="#"><u>Circaea alpina pacifica</u></a>	small enchanter nightshade, small enchanter's nightshade
<a href="#"><u>Cirsium arvense</u></a>	Californian thistle, Canada thistle, Canadian thistle, creeping thistle, field thistle
<a href="#"><u>Cirsium calcareum</u></a>	Cainville thistle
<a href="#"><u>Cirsium eatonii</u></a>	Eaton's thistle
<a href="#"><u>Cirsium neomexicanum</u></a>	New Mexico thistle, lavender thistle

<a href="#"><u>Cirsium undulatum</u></a>	gray thistle, wavy-leaf thistle, wavyleaf thistle
<a href="#"><u>Cirsium vulgare</u></a>	bull thistle, common thistle, spear thistle
<a href="#"><u>Clarkia rhomboidea</u></a>	broadleaf clarkia, diamond clarkia, diamond fairyfan
<a href="#"><u>Claytonia lanceolata</u></a>	lanceleaf springbeauty
<a href="#"><u>Claytonia perfoliata</u></a>	miner's lettuce, miner's-lettuce
<a href="#"><u>Cleome</u></a>	beeplant, spider flower, spiderflower
<a href="#"><u>Collinsia parviflora</u></a>	blue-eyed Mary, littleflower collinsia, maiden blue eyed Mary, small-flower blue-eyed mary, smallflower blue eyed Mary
<a href="#"><u>Collomia debilis</u></a>	alpine collomia
<a href="#"><u>Collomia grandiflora</u></a>	grand collomia, largeflowered collomia
<a href="#"><u>Collomia linearis</u></a>	narrow-leaf mountain-trumpet, narrowleaf mountaintrumpet, slenderleaf collomia, tiny trumpet
<a href="#"><u>Cornus sericea</u></a>	redosier, redosier dogwood
<a href="#"><u>Crataegus douglasii</u></a>	black hawthorn, river hawthorn
<a href="#"><u>Crataegus succulenta</u></a>	fleshy hawthorn
<a href="#"><u>Crepis acuminata</u></a>	long-leaf hawksbeard, longleaf hawksbeard, tapertip hawksbeard
<a href="#"><u>Crepis occidentalis</u></a>	large-flower hawk's-beard, largeflower hawksbeard, western hawksbeard
<a href="#"><u>Cryptantha flavoculata</u></a>	rough-seed catseye, roughseed catseye, roughseed cryptantha
<a href="#"><u>Cryptantha humilis</u></a>	round-spike catseye, roundspike cryptantha
<a href="#"><u>Cryptantha torreyana</u></a>	Torrey's cat's-eye, Torrey's cryptantha, Torreys cryptantha
<a href="#"><u>Cryptantha watsonii</u></a>	Watson cryptantha, Watson's cryptantha
<a href="#"><u>Cryptogramma stelleri</u></a>	fragile rockbrake, slender cliffbrake
<a href="#"><u>Cynoglossum officinale</u></a>	common houndstongue, gypsy-flower, gypsyflower, hound's tongue, houndstongue
<a href="#"><u>Cystopteris fragilis</u></a>	brittle bladder fern, brittle bladderfern, fragile fern
<a href="#"><u>Dactylis glomerata</u></a>	cocksfoot, orchard grass, orchardgrass
<a href="#"><u>Delphinium nuttallianum</u></a>	Nuttal's larkspur, Nuttall larkspur, Nuttall's larkspur, low larkspur, two-lobelarkspur, twolobe larkspur
<a href="#"><u>Deschampsia caespitosa</u></a>	tufted hairgrass
<a href="#"><u>Deschampsia elongata</u></a>	slender hairgrass
<a href="#"><u>Descurainia californica</u></a>	Sierra tansymustard, Sierran tansy mustard, Sierran tansymustard
<a href="#"><u>Descurainia incana</u></a>	mountain tansy mustard, mountain tansy-mustard, mountain tansymustard
<a href="#"><u>Descurainia pinnata</u></a>	green tansymustard, pinnate tansy mustard, pinnate tansymustard, tansymustard, western tansymustard
<a href="#"><u>Dodecatheon alpinum</u></a>	alpine shootingstar
<a href="#"><u>Draba albertina</u></a>	Arc Dome draba, slender draba
<a href="#"><u>Draba breweri cana</u></a>	cushion draba, hoary whitlowgrass, lanceleaf draba, lanceolate draba
<a href="#"><u>Draba densifolia</u></a>	denseleaf draba
<a href="#"><u>Draba nivalis</u></a>	snow draba, yellow arctic draba
<a href="#"><u>Draba rectiflora</u></a>	mountain draba, mountain whitlowgrass
<a href="#"><u>Dracocephalum parviflorum</u></a>	American dragonhead
<a href="#"><u>Elymus canadensis</u></a>	Canada wildrye
<a href="#"><u>Elymus glaucus</u></a>	blue wild rye, blue wildrye

<a href="#"><i>Ephedra viridis</i></a>	green Mormon tea, green ephedra, mormon tea, mormon-tea
<a href="#"><i>Epilobium anagallidifolium</i></a>	alpine willowherb, alpine willowweed, pimpernel willowherb
<a href="#"><i>Epilobium angustifolium</i></a>	blooming sally, fireweed
<a href="#"><i>Epilobium brachycarpum</i></a>	autumn willowherb, autumn willowweed, tall annual willowherb
<a href="#"><i>Epilobium canum garrettii</i></a>	Garrett firechalice, Garrett's firechalice
<a href="#"><i>Epilobium ciliatum glandulosum</i></a>	fringed willowherb, glandular willowherb, glandular willowweed
<a href="#"><i>Epilobium ciliatum watsonii</i></a>	fringed willowherb
<a href="#"><i>Equisetum hyemale</i></a>	horsetail, scouring horsetail, scouringrush, scouringrush horsetail, tall scouring-rush, western scouringrush
<a href="#"><i>Ericameria nauseosa</i></a>	goldenbush, rubber rabbitbrush
<a href="#"><i>Ericameria parryi</i></a>	Parry goldenbush, Parry's rabbitbrush
<a href="#"><i>Erigeron arenarioides</i></a>	sand fleabane
<a href="#"><i>Erigeron caespitosus</i></a>	tufted fleabane
<a href="#"><i>Erysimum capitatum</i></a>	coast wallflower, sand-dune wallflower, sanddune wallflower, western wallflower
<a href="#"><i>Erysimum cheiranthoides</i></a>	treacle wallflower, wallflower mustard, worm-seed wallflower, wormseed mustard, wormseed wallflower
<a href="#"><i>Euclidium syriacum</i></a>	Syria euclidium, Syrian mustard
<a href="#"><i>Eurybia glauca</i></a>	gray aster
<a href="#"><i>Fragaria vesca bracteata</i></a>	woodland strawberry
<a href="#"><i>Fraxinus pennsylvanica</i></a>	green ash
<a href="#"><i>Galium aparine</i></a>	bedstraw, catchweed bedstraw, cleavers, cleaverwort, goose grass, scarthgrass, sticky-willy, stickywilly, white hedge
<a href="#"><i>Galium bifolium</i></a>	twin-leaf bedstraw, twinleaf bedstraw
<a href="#"><i>Gaura parviflora</i></a>	smallflowered gaura, velvetweed, velvety gaura, willow gaura
<a href="#"><i>Gayophytum ramosissimum</i></a>	muchbranched groundsmoke, pinyon groundsmoke
<a href="#"><i>Geum macrophyllum</i></a>	large-leaf avens, largeleaf avens
<a href="#"><i>Glyceria borealis</i></a>	northern mannagrass, small floating manna grass, small floating mannagrass
<a href="#"><i>Glyceria striata</i></a>	fowl manna grass, fowl mannagrass
<a href="#"><i>Glycyrrhiza lepidota</i></a>	American licorice, licorice, wild licorice
<a href="#"><i>Grindelia squarrosa</i></a>	Curleycup gumweed, curlycup gumweed, curlytop gumweed, gumweed, rosinweed, tarweed
<a href="#"><i>Gutierrezia sarothrae</i></a>	Broomsnakeweed, broom snakeweed, broomweed, perennial snakeweed, stinkweed, turpentine weed, yellow top
<a href="#"><i>Hackelia floribunda</i></a>	many-flower stickseed, manyflower stickseed, manyflowered stickseed, showy stickseed
<a href="#"><i>Hackelia micrantha</i></a>	Jessica sticktight, meadow stickseed
<a href="#"><i>Hackelia patens</i></a>	common stickseed, spotted stickseed
<a href="#"><i>Hedysarum boreale</i></a>	boreal sweet-vetch, boreal sweetvetch, northern sweetvetch, sweetvetch
<a href="#"><i>Heracleum maximum</i></a>	common cowparsnip, cow parsnip, cowparsnip
<a href="#"><i>Heuchera parvifolia</i></a>	little-leaf alumroot, littleleaf alumroot

<a href="#"><i>Heuchera rubescens</i></a>	pink alumroot
<a href="#"><i>Holodiscus dumosus</i></a>	bush oceanspray, rockspirea
<a href="#"><i>Hordeum jubatum</i></a>	foxtail barley
<a href="#"><i>Hordeum murinum</i></a>	
<a href="#"><i>leporinum</i></a>	lepor barley, leporinum barley
<a href="#"><i>Humulus lupulus</i></a>	
<a href="#"><i>lupuloides</i></a>	Arizona hops, common hop
<a href="#"><i>Huperzia selago</i></a>	fir club moss, fir clubmoss
<a href="#"><i>Hypericum scouleri</i></a>	
<a href="#"><i>nortoniae</i></a>	Norton's St. Johnswort
<a href="#"><i>Iliamna rivularis</i></a>	streambank globemallow, streambank wild hollyhock, streambank wildhollyhock
<a href="#"><i>Isoetes bolanderi</i></a>	Bolander quillwort, Bolander's quillwort
<a href="#"><i>Ivesia gordonii</i></a>	Gordon ivesia, Gordon's ivesia
<a href="#"><i>Ivesia utahensis</i></a>	Utah mousetail
<a href="#"><i>Juniperus communis</i></a>	common juniper, dwarf juniper
<a href="#"><i>Juniperus osteosperma</i></a>	Utah juniper, utah juniper
<a href="#"><i>Juniperus scopulorum</i></a>	Rocky Mountain juniper, rocky mountain juniper
<a href="#"><i>Lappula occidentalis</i></a>	flat-spine sheepburr, flatspine stickseed, western sticktight
<a href="#"><i>Lappula squarrosa</i></a>	European stickseed, bristly sheepburr
<a href="#"><i>Lathyrus brachycalyx</i></a>	Bonneville pea, Bonneville peavine, Bonneville vetchling, Rydberg's peavine
<a href="#"><i>Lathyrus lanszwertii</i></a>	Nevada pea, Nevada peavine, thistleleaf peavine
<a href="#"><i>Lathyrus pauciflorus</i></a>	few-flower vetchling, fewflower pea
<a href="#"><i>Lathyrus pauciflorus</i></a>	
<a href="#"><i>utahensis</i></a>	Utah pea, Utah peavine
<a href="#"><i>Leonurus cardiaca</i></a>	common motherwort, motherwort
<a href="#"><i>Lepidium densiflorum</i></a>	common pepperweed, greenflower pepperweed, miner's pepperwort, miners pepperweed, peppergrass, pepperweed, prairie pepperweed
<a href="#"><i>Lepidium montanum</i></a>	Montana pepperweed, mountain pepperweed, mountain pepperwort
<a href="#"><i>Lepidium perfoliatum</i></a>	clasping pepperweed, clasping pepperwort, claspingleaf pepperweed
<a href="#"><i>Lepidium virginicum</i></a>	Virginia pepperweed, Virginian peppergrass, peppergrass, poorman pepperweed, poorman's pepper, poorman's-pepperwort
<a href="#"><i>Leptodactylon watsonii</i></a>	Watson's prickly phlox, Watson's pricklygilia
<a href="#"><i>Lesquerella alpina</i></a>	alkaline bladderpod, alpine bladderpod
<a href="#"><i>Lesquerella garrettii</i></a>	Garrett's bladderpod
<a href="#"><i>Lesquerella utahensis</i></a>	Utah bladderpod
<a href="#"><i>Leucopoa kingii</i></a>	spike fescue, spike-fescue
<a href="#"><i>Lewisia pygmaea</i></a>	alpine bitterroot, alpine lewisia, pigmy bitterroot
<a href="#"><i>Leymus cinereus</i></a>	basin wildrye
<a href="#"><i>Ligusticum filicinum</i></a>	fernleaf licorice-root, fernleaf licoricoroot
<a href="#"><i>Linaria dalmatica</i></a>	Dalmatian toadflax, Dalmation toadflax
<a href="#"><i>Linaria vulgaris</i></a>	Jacob's ladder, butter and eggs, butterandeggs, flaxweed, greater butter-and-eggs, ramsted, wild snapdragon, yellow toadflax
<a href="#"><i>Linum perenne</i></a>	blue flax
<a href="#"><i>Lithophragma parviflorum</i></a>	smallflower woodland-star, smallflower woodlandstar
<a href="#"><i>Lithospermum ruderale</i></a>	western gromwell, western stoneseed, white stoneseed

<a href="#"><u><i>Lolium perenne</i></u></a>	italian ryegrass, perennial rye grass, perennial ryegrass
<a href="#"><u><i>Lolium pratense</i></u></a>	meadow fescue, meadow ryegrass
<a href="#"><u><i>Lomatium dissectum</i></u></a>	chocolate-tips, desert parsley, fernleaf biscuitroot
<a href="#"><u><i>Lomatium grayi</i></u></a>	Gray's biscuitroot
<a href="#"><u><i>Lomatium juniperinum</i></u></a>	juniper biscuitroot
<a href="#"><u><i>Lomatium nuttallii</i></u></a>	Nuttall's biscuitroot
<a href="#"><u><i>Lomatium triternatum</i></u></a>	nineleaf biscuitroot
<a href="#"><u><i>Lonicera</i></u></a>	Honeysuckle
<a href="#"><u><i>Lonicera involucrata</i></u></a>	bearberry honeysuckle, twinberry honeysuckle
<a href="#"><u><i>Lonicera utahensis</i></u></a>	Utah honeysuckle
<a href="#"><u><i>Lupinus argenteus</i></u></a>	silvery lupine
<a href="#"><u><i>Lupinus maculatus</i></u></a>	spotted lupine
<a href="#"><u><i>Lupinus sericeus</i></u></a>	Pursh's silky lupine, silky lupine
<a href="#"><u><i>Lycopus americanus</i></u></a>	American bugleweed, American water horehound, American waterhorehound, cut-leaf water-horehound, water horehound, waterhorehound
<a href="#"><u><i>Lygodesmia grandiflora</i></u></a>	largeflower skeletonplant, largeflower skeletonweed, rush-pink
<a href="#"><u><i>Machaeranthera bigelovii commixta</i></u></a>	Bigelow's tansyaster
<a href="#"><u><i>Machaeranthera canescens</i></u></a>	hoary aster, hoary goldenweed, hoary machaeranthera, hoary tansy-aster, hoary tansyaster, purple aster
<a href="#"><u><i>Madia glomerata</i></u></a>	cluster tarweed, mountain tarplant, mountain tarweed
<a href="#"><u><i>Mahonia repens</i></u></a>	Oregongrape, creeping barberry, creeping mahonia, oregon grape, trunkie barberry
<a href="#"><u><i>Maianthemum racemosum amplexicaule</i></u></a>	feathery false lily of the vally, western Solomon's seal, western Solomon's-seal
<a href="#"><u><i>Malcolmia africana</i></u></a>	African addersmouth, African malcomia, African mustard
<a href="#"><u><i>Malus pumila</i></u></a>	paradise apple
<a href="#"><u><i>Malva neglecta</i></u></a>	buttonweed, cheeseplant, cheeseweed, common mallow, dwarf mallow, roundleaf mallow
<a href="#"><u><i>Marrubium vulgare</i></u></a>	horehound, white horehound
<a href="#"><u><i>Matricaria discoidea</i></u></a>	disc mayweed, pineapple weed, pineappleweed
<a href="#"><u><i>Medicago lupulina</i></u></a>	black medic, black medic clover, black medick, hop clover, hop medic, nonesuch, yellow trefoil
<a href="#"><u><i>Medicago sativa</i></u></a>	Alfalfa
<a href="#"><u><i>Melilotus officinalis</i></u></a>	yellow sweet-clover, yellow sweetclover
<a href="#"><u><i>Mentha arvensis</i></u></a>	wild mint
<a href="#"><u><i>Mentzelia laevicaulis evicaulis</i></u></a>	smoothstem blazingstar
<a href="#"><u><i>Mertensia arizonica</i></u></a>	aspen bluebell, aspen bluebells
<a href="#"><u><i>Mertensia brevistyla</i></u></a>	shortstyle bluebell, shortstyle bluebells
<a href="#"><u><i>Mertensia ciliata ciliata</i></u></a>	tall fringe bluebells, tall fringed bluebells
<a href="#"><u><i>Mertensia oblongifolia</i></u></a>	languid-lady, oblongleaf bluebells
<a href="#"><u><i>Mimulus floribundus</i></u></a>	floriferous monkeyflower, manyflowered monkeyflower, purplestem monkeyflower
<a href="#"><u><i>Mimulus glabratus</i></u></a>	round-leaf monkey-flower, roundleaf monkeyflower, smooth monkeyflower

<a href="#"><i>Mimulus guttatus</i></a>	common monkeyflower, seep monkeyflower
<a href="#"><i>Mimulus moschatus</i></a>	Muskflower
<a href="#"><i>moschatus</i></a>	
<a href="#"><i>Mimulus tilingii</i></a>	Tiling's monkeyflower, subalpine monkey-flower, subalpine monkeyflower
<a href="#"><i>Monardella odoratissima</i></a>	Pacific monardella, mountain monardella
<a href="#"><i>Moneses uniflora</i></a>	single delight, single-delight
<a href="#"><i>Montia chamissoi</i></a>	toadlily, water Indianlettuce, water miners lettuce, water minerslettuce
<a href="#"><i>Muhlenbergia filiformis</i></a>	pullup muhly
<a href="#"><i>Muhlenbergia racemosa</i></a>	green muhly, marsh muhly
<a href="#"><i>Nepeta cataria</i></a>	catmint, catnip, catwort, field balm
<a href="#"><i>Oenothera cespitosa</i></a>	tufted eveningprimrose
<a href="#"><i>Oenothera elata hookeri</i></a>	Hooker's evening-primrose
<a href="#"><i>Oenothera pallida</i></a>	pale evening primrose, pale evening-primrose, pale eveningprimrose
<a href="#"><i>Opuntia fragilis</i></a>	brittle cactus, brittle pricklypear, fragile cactus, jumping cactus, little pricklypear, little pricklypear cactus
<a href="#"><i>Oreochrysum parryi</i></a>	Parry's goldenrod
<a href="#"><i>Orobanche uniflora</i></a>	naked broom-rape, naked broomrape, oneflowered broomrape
<a href="#"><i>Orogenia linearifolia</i></a>	Great Basin Indian potato, Indianpotato
<a href="#"><i>Orthilia secunda</i></a>	oneside wintergreen, sidebells, sidebells wintergreen
<a href="#"><i>Orthocarpus tolmiei</i></a>	Tolmie's owl's-clover
<a href="#"><i>Osmorhiza berteroi</i></a>	mountain sweetroot, sweet cicely, sweetcicely
<a href="#"><i>Osmorhiza occidentalis</i></a>	sweetanise, western sweetroot
<a href="#"><i>Packera cana</i></a>	woolly groundsel
<a href="#"><i>Packera streptanthifolia</i></a>	Rocky Mountain groundsel
<a href="#"><i>Paxistima myrsinites</i></a>	Mountain lover, Oregon boxleaf, boxleaf, boxleaf myrtle
<a href="#"><i>Pedicularis groenlandica</i></a>	bull elephant's-head, elephanthead lousewort
<a href="#"><i>Pellaea breweri</i></a>	Brewer's cliffbrake
<a href="#"><i>Penstemon cyananthus</i></a>	Wasatch beardtongue
<a href="#"><i>Penstemon cyanocaulis</i></a>	bluestem beardtongue
<a href="#"><i>Penstemon eatonii</i></a>	Eaton penstemon, Eaton's penstemon
<a href="#"><i>Penstemon humilis</i></a>	low beardtongue, low penstemon
<a href="#"><i>Penstemon leonardii</i></a>	Leonard's beardtongue, Leonard's penstemon
<a href="#"><i>Penstemon montanus</i></a>	cordroot beardtongue
<a href="#"><i>Penstemon sepalulus</i></a>	littlecup beardtongue
<a href="#"><i>Penstemon subglaber</i></a>	smooth penstemon
<a href="#"><i>Penstemon whippleanus</i></a>	Whipple's penstemon, dark beardtongue
<a href="#"><i>Petrophyton caespitosum</i></a>	mat rockspirea, rockspirea, tufted rockmat
<a href="#"><i>Phacelia hastata hastata</i></a>	silver-leaf scorpion-weed, silverleaf phacelia
<a href="#"><i>Phacelia heterophylla</i></a>	variable-leaf scorpion-weed, varileaf phacelia, virgate phacelia, wand phacelia
<a href="#"><i>Phacelia linearis</i></a>	linearleaf phacelia, threadleaf phacelia
<a href="#"><i>Phalaris arundinacea</i></a>	reed canary grass, reed canarygrass
<a href="#"><i>Physaria chambersii</i></a>	Chamber's twinpod, Chambers' twinpod
<a href="#"><i>Physocarpus alternans</i></a>	dwarf ninebark
<a href="#"><i>Physocarpus malvaceus</i></a>	mallow ninebark

<a href="#"><i>Picea engelmannii</i></a>	Engelmann spruce, Engelmann's spruce, columbian spruce, mountain spruce, silver spruce, white spruce
<a href="#"><i>Picea pungens</i></a>	blue spruce, colorado blue spruce, silver spruce
<a href="#"><i>Pinus flexilis</i></a>	limber pine, rocky mountain white pine
<a href="#"><i>Plagiobothrys scouleri</i></a>	Scouler popcornflower, Scouler's popcornflower, meadow popcorn-flower
<a href="#"><i>Plantago lanceolata</i></a>	English plantain, buckhorn plantain, lanceleaf Indianwheat, lanceleaf plantain, narrowleaf plantain, ribgrass, ribwort
<a href="#"><i>Plantago major</i></a>	broadleaf plantain, buckhorn plantain, common plantain, great plantain, rippleseed plantain
<a href="#"><i>Plantago patagonica</i></a>	woolly Indianwheat, woolly plantain, woolly plantian, woolly Indianwheat, woolly plantain
<a href="#"><i>Poa bulbosa</i></a>	bulbous blue grass, bulbous bluegrass
<a href="#"><i>Polygonum aviculare</i></a>	prostrate knotweed, yard knotweed
<a href="#"><i>Polygonum bistortoides</i></a>	American bistort
<a href="#"><i>Polygonum convolvulus</i></a>	black bindweed, black-bindweed, climbing buckwheat, climbing knotweed, cornbind, dullseed cornbind, pink smartweed, wild buckwheat
<a href="#"><i>Polygonum douglasii</i></a>	Douglas knotweed, Douglas' knotweed
<a href="#"><i>Polygonum lapathifolium</i></a>	curltop ladythumb, curlytop knotweed, curlytop smartweed, dock-leaf smartweed, nodding smartweed, pale smartweed, smartweed
<a href="#"><i>Polygonum minimum</i></a>	broadleaf knotweed, dwarf knotweed, zigzag knotweed
<a href="#"><i>Polygonum ramosissimum</i></a>	bushy knotweed, tall knotweed, yellow knotweed, yellow-flower knotweed
<a href="#"><i>Polypodium hesperium</i></a>	western polypody
<a href="#"><i>Polystichum lonchitis</i></a>	hollyfern, northern holly fern, northern hollyfern
<a href="#"><i>Populus angustifolia</i></a>	narrowleaf cottonwood
<a href="#"><i>Potentilla diversifolia</i></a>	mountain-meadow cinquefoil, varileaf cinquefoil
<a href="#"><i>Potentilla fruticosa</i></a>	No data
<a href="#"><i>Potentilla glandulosa</i></a>	gland cinquefoil, sticky cinquefoil
<a href="#"><i>Potentilla gracilis</i></a>	graceful cinquefoil, northwest cinquefoil, slender cinquefoil
<a href="#"><i>Primula parryi</i></a>	Parry primrose, Parry's primrose, bog primrose, brook primrose
<a href="#"><i>Prosartes trachycarpa</i></a>	No data
<a href="#"><i>Prunus virginiana melanocarpa</i></a>	black chokecherry, choke cherry
<a href="#"><i>Pseudoroegneria spicata</i></a>	bluebunch wheatgrass, bluebunch-wheat grass
<a href="#"><i>Pseudotsuga menziesii</i></a>	Douglas fir, Douglas-fir, douglas fir, douglas spruce, oregon pine, red fir
<a href="#"><i>Pteridium aquilinum</i></a>	bracken, bracken fern, brackenfern, northern bracken fern, western brackenfern
<a href="#"><i>Purshia tridentata</i></a>	antelope bitterbrush
<a href="#"><i>Pyrola asarifolia</i></a>	alpine shinleaf, liverleaf wintergreen, pink wintergreen
<a href="#"><i>Quercus gambelii</i></a>	Gambel oak, Gambel's oak
<a href="#"><i>Quercus gambelii gambelii</i></a>	Gambel oak, Gambel's oak
<a href="#"><i>Rhus trilobata trilobata</i></a>	ill-scented sumac, skunkbush, skunkbush sumac
<a href="#"><i>Ribes cereum</i></a>	wax currant, wax current
<a href="#"><i>Ribes hudsonianum</i></a>	black currant, northern black currant
<a href="#"><i>Ribes inerme</i></a>	whitestem gooseberries, whitestem gooseberry

<a href="#"><i>Ribes montigenum</i></a>	alpine prickly currant, gooseberry currant, gooseberry current, mountain gooseberry
<a href="#"><i>Ribes viscosissimum</i></a>	sticky currant
<a href="#"><i>Ribes wolfii</i></a>	Wolf's currant, wolf currant
<a href="#"><i>Robinia pseudoacacia</i></a>	black locust, false acacia, yellow locust
<a href="#"><i>Rorippa alpina</i></a>	alpine yellowcress
<a href="#"><i>Rorippa curvisiliqua</i></a>	curvedpod yellowcress
<a href="#"><i>Rorippa nasturtium-aquaticum</i></a>	Watercress
<a href="#"><i>Rorippa sinuata</i></a>	spreading yellowcress
<a href="#"><i>Rorippa teres</i></a>	southern marsh yellowcress
<a href="#"><i>Rosa nutkana hispida</i></a>	bristly Nootka rose
<a href="#"><i>Rosa woodsii</i></a>	Wood's rose, Woods' rose, woods rose
<a href="#"><i>Rubus idaeus strigosus</i></a>	common red raspberry, grayleaf raspberry, grayleaf red raspberry, red raspberry
<a href="#"><i>Rubus parviflorus</i></a>	thimbleberry, western thimbleberry
<a href="#"><i>Rudbeckia occidentalis</i></a>	western coneflower
<a href="#"><i>Rumex acetosella</i></a>	common sheep sorrel, field sorrel, red (or sheep) sorrel, red sorrel, sheep sorrel
<a href="#"><i>Rumex crispus</i></a>	Curley dock, curly dock, narrowleaf dock, sour dock, yellow dock
<a href="#"><i>Rumex maritimus</i></a>	bristle dock, golden dock
<a href="#"><i>Rumex salicifolius</i></a>	willow dock
<a href="#"><i>Sambucus nigra cerulea</i></a>	blue elderberry, elderberry
<a href="#"><i>Sambucus racemosa</i></a>	European red elder, red elderberry, scarlet elderberry
<a href="#"><i>Sanguisorba minor muricata</i></a>	small burnet
<a href="#"><i>Saxifraga odontoloma</i></a>	brook saxifrage, streambank saxifrage
<a href="#"><i>Saxifraga oregana</i></a>	Oregon saxifrage, box saxifrage
<a href="#"><i>Saxifraga rhomboidea</i></a>	diamond-leaf saxifrage, diamondleaf saxifrage
<a href="#"><i>Sedum debile</i></a>	orpine stonecrop, weakstem stonecrop
<a href="#"><i>Selaginella watsonii</i></a>	Watson's spike-moss, Watson's spikemoss, alpine spikemoss
<a href="#"><i>Senecio amplexens holmii</i></a>	Holm's groundsel, Holm's ragwort
<a href="#"><i>Senecio atratus</i></a>	tall blacktip ragwort
<a href="#"><i>Senecio crassulus</i></a>	meadow groundsel, thickleaf groundsel, thickleaf ragwort
<a href="#"><i>Senecio eremophilus kingii</i></a>	King's ragwort, king groundsel, ragwood groundsel
<a href="#"><i>Senecio fremontii blitoides</i></a>	dwarf mountain ragwort
<a href="#"><i>Senecio integerrimus</i></a>	lamb-tongue ragwort, lambstongue groundsel, lambstongue ragwort
<a href="#"><i>Senecio multilobatus</i></a>	lobeleaf groundsel
<a href="#"><i>Senecio serra</i></a>	butterweed, butterweed groundsel, tall ragwort
<a href="#"><i>Senecio triangularis</i></a>	arrowleaf groundsel, arrowleaf ragwort
<a href="#"><i>Senecio uintahensis</i></a>	No data
<a href="#"><i>Sibbaldia procumbens</i></a>	creeping sibbaldia, creeping-glow-wort, prostrate sibbaldia
<a href="#"><i>Sidalcea</i></a>	checkerbloom, checkermallow
<a href="#"><i>Sisymbrium altissimum</i></a>	Jim Hill mustard, tall hedge-mustard, tall mustard, tall tumbledustard, tumble mustard, tumbledustard, tumbleweed mustard

<a href="#"><i>Smelowskia calycina americana</i></a>	American false candytuft
<a href="#"><i>Solidago canadensis</i></a>	Canada goldenrod, Canadian goldenrod, common goldenrod
<a href="#"><i>Solidago multiradiata</i></a>	Rocky Mountain goldenrod, mountain goldenrod
<a href="#"><i>Solidago simplex simplex simplex</i></a>	Mt. Albert goldenrod, New Mexican goldenrod
<a href="#"><i>Solidago velutina</i></a>	sparse goldenrod, three-nerve goldenrod, threenerve goldenrod
<a href="#"><i>Sphaeralcea coccinea</i></a>	copper mallow, orange globemallow, red falsemallow, scarlet globemallow
<a href="#"><i>Sphaeralcea munroana</i></a>	Munro's globemallow, Munroe globemallow
<a href="#"><i>Sphaeromeria diversifolia</i></a>	separateleaf chickensage
<a href="#"><i>Stanleya pinnata</i></a>	desert prince'splume, desert princesplume, golden prince's-plume
<a href="#"><i>Stenotus acaulis</i></a>	stemless goldenweed, stemless mock goldenweed
<a href="#"><i>Symphoricarpos oreophilus</i></a>	mountain snowberry, whortleleaf snowberry
<a href="#"><i>Symphoricarpos oreophilus utahensis</i></a>	Utah snowberry
<a href="#"><i>Taraxacum officinale</i></a>	blowball, common dandelion, dandelion, faceclock
<a href="#"><i>Tetradymia canescens</i></a>	gray horsebrush, spineless horsebrush
<a href="#"><i>Thelypodium sagittatum</i></a>	arrow thelypody, slender thelypody
<a href="#"><i>Thelypodium wrightii</i></a>	Wright thelypody, Wright's thelypody, wright stanleyella
<a href="#"><i>Tonestus kingii</i></a>	King's serpentweed
<a href="#"><i>Tragopogon dubius</i></a>	Western goat's beard, common salsify, goat's beard, goatsbeard, meadow goat's-beard, salsifis majeur, salsify, western salsify, wild oysterplant, yellow goat's beard, yellow salsify
<a href="#"><i>Tribulus terrestris</i></a>	Mexican sandbur, Texas sandbur, bullhead, caltrop, goathead, puncture vine, puncturevine
<a href="#"><i>Trifolium kingii</i></a>	King's clover
<a href="#"><i>Trifolium longipes</i></a>	long-stalk clover, longstalk clover
<a href="#"><i>Trifolium pratense</i></a>	red clover
<a href="#"><i>Trifolium repens</i></a>	Dutch clover, ladino clover, white clover
<a href="#"><i>Urtica dioica</i></a>	California nettle, slender nettle, stinging nettle, tall nettle
<a href="#"><i>Valeriana capitata</i></a>	captiate valerian, sharpleaf valerian
<a href="#"><i>Valeriana edulis</i></a>	edible valerian, tobacco root, tobaccoroot
<a href="#"><i>Valeriana occidentalis</i></a>	small-flower valerian, western valerian, western valeriana
<a href="#"><i>Verbascum thapsus</i></a>	big taper, common mullein, flannel mullein, flannel plant, great mullein, mullein, velvet dock, velvet plant, woolly mullein
<a href="#"><i>Verbena bracteata</i></a>	bigbract verbena, bracted vervain, carpet vervain, prostrate verbena, prostrate vervain
<a href="#"><i>Vicia americana</i></a>	American deervetch, American vetch
<a href="#"><i>Viola adunca</i></a>	blue violet, hook violet, hookedspur violet
<a href="#"><i>Viola adunca adunca</i></a>	hook-spur violet, hookedspur violet
<a href="#"><i>Viola purpurea venosa</i></a>	goosefoot violet, goosefoot yellow violet
<a href="#"><i>Viola vallicola</i></a>	sagebrush violet, valley violet
<a href="#"><i>Woodsia oregana</i></a>	Oregon cliff fern, Oregon woodsia

## Appendix D

### NEPA and NHPA Compliance

The Department of Interior gave notice of revised procedures for implementing the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) regulations. These final implementing procedures are being issued in Department of Interior Manual 516 DM, Chapter 2, Appendix 1, which describes categorical exclusions, *i.e.*, categories of actions, which do not individually or cumulatively have a significant effect on the human environment and therefore normally do not require further analysis in either an environmental assessment or an environmental impact statement. The revision adds two such categories of actions to the agencies' NEPA procedures: (1) Hazardous fuels reductions and activities; and (2) rehabilitation activities for lands and infrastructure impacted by fires or fire suppression. The two new fire management categorical exclusions (CEs) were published in the *Federal Register* (Vol 68, No. 108, pages 33814-33824). The NPS has determined that in very limited instances parks doing suppression and fuels reduction activities, which meet the guidelines, can use the CEs in conjunction with fire management plans. Timpanogos Cave National Monument meets those specified guidelines.

The specific categorical exclusion is listed in Appendix H and states; "Hazardous fuels reduction activities using prescribed fire not to exceed 4,500 acres, and mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing, not to exceed 1,000 acres. Such activities: Shall be limited to areas (1) in wildland-urban interface and (2) Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside the wildland-urban interface; Shall be identified through a collaborative framework as described in "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan;" Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans; Shall not be conducted in wilderness areas or impair the suitability of wilderness study areas for preservation as wilderness; Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and may include the sale of vegetative material if the primary purpose of the activity is hazardous fuels reduction

## **Appendix E**

### **Interagency Agreements and Supplemental Information**

#### **INTERAGENCY AGREEMENT WILDLAND FIRE SUPPRESSION**

This Memorandum of Agreement is made and entered into by and between Timpanogos Cave National monument, National Park Service, U.S. Department of Interior, hereinafter referred to as the Park Service, and Uinta National Forest, U.S. Forest Service, U.S. Department of Agriculture, herinafter referred to as the Forest Service.

##### **Article I: Authority**

Legislative authority to enter into this agreement is based on the Economy Act of 1932, 31 U.S.C. 1535 and a Memorandum of Understanding between the Forest Service and the National Park Service for Planning and Program Coordination dated 2-22-88. The latter document states that the Park Service and Forest Service may develop supplemental agreements to accomplish specific objectives. A management goal for both agencies is full suppression of all wildfires in lower American Fork Canyon. Therefore, the park Service and Forest Service agree to provide mutual assistance in meeting this management goal.

##### **Article II. Statements of Work**

The Park Service agrees to:

1. Provide a minimum of 1 certified (Red Card) firefighter crew member within 1 hour notice to support Forest Service fire suppression crews working in American Fork Canyon.
2. Provide up to 1 additional firefighter crew member for extended fire suppression detail on the Uinta National Forest.
3. Provide 1 or 2 overhead personnel for extended local detail if possible.
4. Provide a slip-on pumper unit (engine) with 120 gallon capacity to assist in fire suppression in areas accessible by vehicle. This unit will respond with 2 hours notice.
5. Reserve the Visitor Center auditorium as needed for fire training except on holidays and weekends.
6. Assist with fire prevention efforts in American Fork Canyon by providing interpretive information to visitors.

The Forest Service agrees to:

1. Provide a minimum of 1 crew within 1 hour notice to assist with fire suppression within Timpanogos Cave National Monument.
2. Provide additional resource units as required for full suppression of wildfires that extend beyond the first burning period.

*Timpanogos Cave National Monument – Fire Management Plan*

3. Make available daily fire weather information during the fire season, normally June through October.
4. Provide communications and dispatch for individual fires through the Utah County Sheriff's Office or directly through Forest Service radio frequencies.

The Park Service and Forest Service mutually agree to:

1. Communicate on Forest Service radio frequencies on fire suppression and other emergency operations.
2. Meet regularly (at least annually) to discuss any problems involved in this agreement as well as other management concerns.
3. Exchange information on fire suppression and updates in fire management policies and plans.

Article III: Term of Agreement

This Interagency Agreement will become effective on the date of the last signature below and remain in full force and effect for five years subject to amendment by mutual agreement. This Interagency Agreement may also be terminated upon 60 days written notice by either agency.

National Park Service, Timpanogos Cave National Monument

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Superintendent	Date
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U.S. Forest Service, Uinta National Forest

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District Ranger	Date
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## List of Classified Structures

A List of Classified Structures inventory was carried out in November 1975. A National Register nomination was submitted in February 1982 for the Timpanogos Cave Historical District. On October 13, 1982, the district was placed on the National Register. The contributing structures of the Historic District are: Building Number 2, Residence F Bridge; Building number 126, Rest Room; Building Number 127, Rest Room; Storage Building; Two Cold Cellars; and Old Cave Trail (see enclosed map titled "Historic District"). Table 10 illustrates historic structures and buildings and their conditions. The condition assessment ratings are as follows:

Excellent (E) Like new	Poor (P) Failure of systems/materials
Good (G) Intact, needs no repair	Obsolete (O) Beyond Rehabilitation
Fair (F) Signs of wear	

Table 10 HISTORIC STRUCTURES/BUILDINGS AND THEIR CONDITIONS

Historic Structure/ Building Number/Condition	Materials	Builders	Dates	Current Use
1. Residence (HS-2) F	Rubble stone	Park Service	1941	Residence
2. Bridge F	Rubble stone	Park Service	1935 (circa)	Vehicle/Pedestrian Access
3. Cave Rest Room (HS-127) F	Rubble stone	Park Service	1939	Rest Room
4. Rest Room (HS-126) P	Rubble stone	Forest Service	1928	Storage
5. Storage Building (Ticket Booth) O	Rubble stone	Forest Service	1922 (circa)	Storage
6. Two Cold Cellars P	Rubble stone	Forest Service	1930	Vacant
7. Old Cave Trail	Rubble stone	Forest Service	1920s	None

**Appendix F**  
**Utah Smoke Management Plan**

**Utah Smoke Management Plan**

Available online at <http://www.utahsmp.net/>

**Utah Smoke Management Plan**

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### X. Program Management

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Appendix A: Memorandum of Understanding

Appendix B: Memorandum of Understanding

Appendix C: Interagency Agreement for Management of Eastern Great Basin Coordinating Center

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Form 5: Daily Emission Report

Form 6: Hourly Plume Observation Record (Optional)

### **I. PURPOSE**

The purpose of this Utah Smoke Management Plan (SMP) is to identify the responsibilities of the Utah Division of Air Quality (DAQ) and Federal, and State land managers (Land Managers) to coordinate procedures that mitigate the impacts of prescribed fire and wildland fire used for resource benefits on public health, public safety and visibility. This plan is designed to meet the requirements of Title R307, Utah's air quality rules, and the policies of the U.S. Environmental Protection Agency's (EPA) Interim Air Quality Policy on Wildland and Prescribed Fires (Interim Policy). On November 8, 1999, the EPA certified the plan under the Interim Policy. The SMP may be revised at the end of the 1999 fall burning season and each year thereafter with the concurrence of all signatories to the attached Memorandum of Understanding.

### **II. GOALS**

To minimize or prevent smoke impacts to such a degree as possible to protect public health, public safety and visibility

To use prescribed fire and wildland fire used for resource benefits to accomplish land management objectives of wildland fuel hazard reduction, vegetative management, natural ecological practices, and wildlife habitat improvement

To develop an emission inventory for pollutants of interest based on reports of prescribed fire, wildland fire used for resource benefits, and wildland fire activities

To develop a system for reporting and coordinating burning operations on all forest and range lands in the State

To dispose of or reduce the amount of wildland fuels on lands in the State

### **III. SCOPE**

The SMP provides direction and operating procedures for all organizations involved in the use of prescribed fire and wildland fire used for resource benefits. It applies to all signatories to the Memorandum of Understanding (MOU), Appendix A. The SMP also applies to landowners who use prescribed fire on lands where the Department of Natural Resources (DNR) provides fire protection during the June-October fire season, with the exception of landowners who use prescribed fire covering less than 20 acres and are permitted through the DNR's Division of Forestry, Fire and State Lands.

This plan does not apply to agricultural outdoor burning and open burning as defined by Utah Code 19-2-114. All future reference to fire in this plan will refer only to prescribed fire, wildland fire used for resource benefits, and wildland fire unless otherwise indicated. Lands that have been classified as Conservation Reserve Program (CRP) lands, that are adjacent to agriculture lands, will be treated as agricultural lands and will not have to abide by the requirements of the SMP. CRP lands that are adjacent to Federal or State lands will be required to abide by the requirements of the SMP.

### **IV. DEFINITIONS**

**Air Quality** - the characteristics of the ambient air (all locations accessible to the general public) as indicated by concentrations of the six air pollutants for which national standards have been established (e.g., particulate matter, sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, and lead), and by visibility in mandatory Federal Class I areas. For the purposes of this Smoke Management Plan, concentrations of particulate matter are taken as the primary indicators of ambient air quality.

**Burn Window** - the period of time when the prescribed fire is scheduled for ignition.

**Conservation Reserve Program (CRP)**: lands that have been set aside for the specific purpose of conversion from farming lands to wildlands.

**Class I Areas** - an area set aside under 42 U.S.C. 7491 to receive the most stringent protection from air quality degradation. Mandatory Class I Federal areas are: 1) international parks, 2) national wilderness areas which exceed 5,000 acres in size, 3) national memorial parks which exceed 5,000 acres in size, and 4) national parks which exceed 6,000 acres and were in existence on August 7, 1977. The extent of a mandatory Class I Federal area includes subsequent changes in boundaries, such as park expansions. The five Class I Areas in Utah include: 1) Zion National Park, Bryce National Park, Capitol Reef National Park, Arches National Park, Canyonlands National Park.

**Clearing Index** - an indicator of the predicted rate of clearance of ground level pollutants from a given area. This number is calculated by the National Weather Service from daily measurements of temperature lapse rates and wind speeds from ground level to 10,000 feet.

**De minimis** - refers to the minimum or least.

**Duff** - the partly decayed organic matter on the forest floor.

**Eastern Great Basin Coordination Center (EGBCC)** - the center established to provide an interagency approach to wildland fire management in the area within the Eastern Great Basin Area defined as that area including state and federal agency lands within the established Forest Service Intermountain Region geographic boundary of southern Idaho; western Wyoming including the Bridger-Teton National Forest, and Teton National Park; all lands within the state of Utah; and the Arizona Strip Field Office of the BLM. Participating agencies include: the Intermountain Region of the U.S. Forest Service; the Rocky Mountain Region of the National Park Service; the Idaho, Utah, and Wyoming Offices of the Bureau of Land Management; the Phoenix, Portland, Albuquerque Area and Navajo Area Offices of Bureau of Indian Affairs; the Mountain and Prairie Region of the U.S. Fish and Wildlife Service; the State of Idaho Department of Lands; and the State of Utah Division of State Lands and Forestry.

**Emission** - the act of discharge into the atmosphere of an air contaminant or an effluent which contains or may contain an air contaminant; or the effluent so discharged into the atmosphere.

**Fire prescription** - the measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

**Fuel Loading** - the amount of fuel present expressed quantitatively in terms of weight of fuel per unit area. This may be available fuel or (consumable fuel) total fuel and is usually dry weight.

**Land Manager** - includes any federal, state, local or private entity that administers, directs, oversees or controls the use of public or private land, including the application of fire to the land.

**National Ambient Air Quality Standards (NAAQS)** - the standards for maximum acceptable concentrations of pollutants in the ambient air to protect public health with an adequate margin of safety, and to protect public welfare from any known or anticipated adverse effects of such pollutants (e.g., visibility impairment, soiling, materials damage, etc.) in the ambient air. National standards have been established for particulate matter, sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, and lead, and are specified in 40 CFR Part 50.

**Non-attainment Area** - "an area which is shown by monitored data or which is calculated by air quality modeling (or other methods determined by the Administrator, EPA to be reliable) to exceed any National Ambient Air Quality Standard for such pollutant" and includes any area designated as non-attainment under 42 U.S.C. 7407.

**Particulate matter** - the liquid or solid particles such as dust, smoke, mist, or smog found in air emissions.

**Prescribed fire/Prescribed burn** - any fire ignited by management actions to meet specific objectives (i.e., managed to achieve resource benefits).

**Prescribed fire plan/burn plan** - the plan required for each fire application ignited by managers. It must be prepared by qualified personnel and approved by the appropriate agency administrator prior to implementation. Each plan follows specific agency direction and must include critical elements described in agency manuals.

**Smoke Program Coordinator** - the decision making authority that provides the daily coordination between members of the Airshed Group and the communication necessary to implement necessary burning restrictions.

**Resource Benefit Fire** - a lightning-caused fire that is being allowed to burn because it meets land management objectives.

**Smoke management** - includes but is not limited to techniques to reduce emissions and smoke impacts, to identify and avoid smoke sensitive receptors, to monitor and evaluate the smoke impacts of each burn, and to coordinate among land management agencies to minimize cumulative impacts.

**Synoptic** - relating to or displaying atmospheric or weather conditions as they exist simultaneously over a broad area.

**Smoke sensitive receptors** - population centers such as towns and villages, campgrounds and trails, hospitals, nursing homes, schools, roads, airports, mandatory Class I Federal areas, Non-attainment areas, areas whose air quality monitoring data indicate pollutant levels that are close to health standards, etc. where smoke and air pollutants can adversely affect public health, safety and welfare.

**Utah Airshed Group** - a group composed of the representatives of the agencies that are signatories to the MOU, Appendix A, that are involved in the use of prescribed fire, and wildland fire used for resource benefits to meet land management objectives. This group meets at least once a year to evaluate the effectiveness of the SMP.

**Utah Airshed Oversight Group** - a group composed of managerial representatives of the agencies that are signatories to the MOU, Appendix B, that conduct performance evaluations of the Smoke Program Coordinator.

**[www.utahsmp.net](http://www.utahsmp.net)** - the home page for the Utah Interagency Smoke Management Program.

**Wildland** - an area in which development is essentially non-existent, except for pipelines, power lines, roads, railroads, or other transportation or conveyance facilities.

**Wildland fire** - any non-structure fire, other than prescribed fire, that occurs in the wildland.

**Wildland fire implementation plan (WFIP)** - a progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits. A full WFIP consists of three stages. Different levels of completion may occur for differing management strategies (i.e., fires managed for resource benefits will have two-three stages of the WFIP completed while some fires that receive a suppression response may only have a portion of Stage I completed).

**Wildland fire used for resource benefits (WFURB)** - the management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas.

**Wildland fuel** - an association of naturally occurring plant materials that occur at ground, surface, and aerial strata, with the elements of distinctive species.

## **V. ORGANIZATION AND OPERATING PROCEDURES**

**A.** The Utah Smoke Management Program is a cooperative effort between the DAQ and the agencies that are involved in the use of prescribed fire and wildland fire used for resource benefits to meet land management objectives. The organizational structure developed to operate the Smoke Management Program consists of a Smoke Program Coordinator, Utah Airshed Group and Utah Airshed Oversight Group.

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**B.** Each signatory of the MOU, Appendix A, receives full membership in the Utah Airshed Group. This group, composed of representatives of the entire membership, meets at least once a year to evaluate the effectiveness of the SMP. Specifically, the role of the Utah Airshed Group is to:

- 1) provide overall management direction and guidance to the Smoke Program Coordinator by functioning as an interagency steering committee to ensure appropriate implementation of the SMP;
- 2) review and evaluate the results of the previous burning season and prescribed fires planned for next five years;
- 3) review procedures in the SMP and make revisions if necessary;
- 4) advise on appropriate boundaries for airsheds and impact zones (see Appendix E);
- 5) work towards resolving interairshed and interstate smoke problems;
- 6) review operating costs of the smoke management program;
- 7) provide smoke management training for agencies;
- 8) prepare and disseminate information on prescribed fire, wildland fire, wildland fire used for resource benefits, and air quality; and
- 9) review and evaluate dispersion and emission reduction techniques.

**C.** The Smoke Program Coordinator is responsible for the daily operation and management of the SMP. The Smoke Program Coordinator is the decision making authority that provides the daily coordination among all signatories to the MOU and the communication necessary to implement, after consulting with the DAQ, necessary burn approval or denial decisions. The Smoke Program Coordinator will rely on forecast meteorological information from the National Weather Service, DAQ, and others, in addition to air quality data from the DAQ's Air Monitoring Center, and burn plan information or other information from Land Managers to make burn approval or denial decisions. Specifically, the role of the Smoke Program Coordinator will be to:

- 1) develop smoke forecasts for prescribed fire and wildland fire used for resource benefits activities, utilizing the information to develop zones where burning may or may not be approved, and evaluate smoke effects between zones;
- 2) provide ongoing coordination and communication with the DAQ and other signatory parties;
- 3) coordinate monitoring of compliance with National Ambient Air Quality Standards with the DAQ's Air Monitoring Center staff;
- 4) act as liaison with all participating agencies, developing direction for interagency cooperation;
- 5) assess the potential impact of wildland fuel conditions, weather and other factors on potential smoke production;
- 6) encourage use of appropriate technology to develop and assess potential impacts of smoke production from wildland fire used for resource benefits, wildland fire and prescribed fire activities;
- 7) schedule prescribed fire project while protecting air quality;
- 8) coordinate operations and findings with counterparts on inter-state basis;
- 9) coordinate with the National Weather Service, DAQ, and others to assess meteorological and climatological data to mitigate impacts from fire activities on Utah airsheds;
- 10) develop a database for: a) tracking whether emission reduction and smoke dispersion objectives were met for prescribed fires and wildland fire used for resource benefits, b) establishing particulate matter or other air pollutant(s) emissions inventory and c) documenting contribution to NAAQS violations, if any, based on monitoring information submitted by Land Managers to the Smoke Program Coordinator at DAQ and other data;
- 11) submitting an annual report summarizing the information listed in #10 to the Utah Airshed Group for review and approval by March 15 each year for the preceding calendar year; and
- 12) receive direction and oversight from the Utah Airshed Oversight Group.

### **D. Funding**

Current funding for the Smoke Program Coordinator position and support functions will be provided through and in accordance with the existing Interagency Agreement for the management of the Eastern Great Basin Coordination

Center (see Appendix C). A separate document specifying the Smoke Program Coordinator responsibilities and funding is included in Appendix B.

## **VI. PRESCRIBED FIRE REQUIREMENTS**

### **A. Utah Annual Burn Schedule (Form 2)**

1) Each calendar year, Land Managers who burn more than 50 acres per year are required to submit to the Smoke Program Coordinator at the DAQ the Utah Annual Burn Schedule (see Form 2) of prescribed fires that are scheduled to be completed that calendar year, including the following information: project number, project name, Air Quality Basin, location (UTM coordinate for the central point of the prescribed fire), de minimis category, total project acres, project elevation, major fuel model, type of burn (understory, broadcast, etc.), earliest burn date, burn duration, ignition method (helitorch, hand drip torch, etc.), and county.

2) The proposed Utah Annual Burn Schedule (see Form 2) should be submitted between January 1 and March 15 each year.

### **B. De minimis Prescribed Fires**

This category is intended for clean-up activities that have negligible air quality impacts. A review of this category will be conducted by the Utah Airshed Group annually.

#### **1) Applicability**

This category applies to:

a) prescribed fires covering up to 20 acres/day or resulting in air emissions of less than 0.5 tons of particulate matter per day.

#### **2) Requirements**

a) The Land Manager is required to notify the Smoke Program Coordinator by fax, e-mail, or phone the morning of the burn.

b) The Land Manager is required to record the de minimis prescribed fire on the Utah Annual Burn Schedule (Form 2).

c) Ignition can only occur when the Weather Service Clearing Index is above 500.

### **C. Prescribed Fires Requiring Burn Plans--Form 3: Pre-Burn Information (prescribed fires covering more than 20 acres/day or producing emissions of more than 0.5 tons of particulate matter per day)**

Land Managers are required to submit the Pre-burn Information (see Form 3) in addition to the agency burn plan to the Smoke Program Coordinator at the DAQ by fax, e-mail, or mail, two weeks before the beginning of the ignition window. Land Managers are required to submit the Burn Request (see Form 4) to the Program Coordinator before the ignition of prescribed fires requiring burn plans.

#### **1) Applicability**

This category applies to:

a) prescribed fires covering more than 20 acres or resulting in air emissions more than 0.5 tons of particulate matter per day.

#### **2) Burn Plan Elements**

The completed Pre-burn Information (see Form 3) must be submitted to the Smoke Program Coordinator at DAQ for the evaluation of Smoke Management components at least two weeks before the beginning of the ignition window and must contain the following information:

a) the three-letter ID, project number, date submitted, name of person submitting the form, Burn Manager, and phone numbers;

b) summary of burn objectives;

c) Class I or Non-attainment Area within 15 miles;

d) sensitive receptors and distance/degrees from project site;

e) planned mitigation methods (avoidance, dilution, emission reduction);

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- f) smoke dispersion model used;
- g) estimated range of total particulate matter anticipated;
- h) optional information on loading and fuel moisture available.

3) Prescribed fires that are delayed or not completed following burn approval do not need to be resubmitted to the Smoke Program Coordinator unless changes are made to the burn plan. Burn plans will be retained by the Smoke Program Coordinator until the project is completed. If an approved project is not carried out, the Land Manager will describe reason(s) why the prescribed fire was not completed (at bottom of Burn Request, Form 4) and submit Form 4 to the Smoke Program Coordinator by 0800 the following day.

**D. Burn Request (Form 4)**

1) Land Managers are required to submit a Burn Request (see Form 4) to the Smoke Program Coordinator at DAQ for approval by 1000 hours two business days (Monday - Friday) before the beginning of the planned ignition, not the proposed ignition window. An original form, either faxed or e-mailed are acceptable submittal. Burn requests should include the following information on the burn request form:

- a) The three-Letter ID and project number consistent with the Utah Annual Burn Schedule (Form 2) submitted between January 1 and March 15;
- b) The date submitted and by whom; and
- c) The Burn Manager conducting the burn and phone numbers.

2) The Smoke Program Coordinator will issue a decision after consulting with the DAQ, either approving, approving with conditions, or denying burning by 4:00 pm two business days (Monday - Friday) before the beginning of the planned ignition. The burn approval decision will be given by e-mail, fax, or recorded message. If a Land Manager is not notified of the burn approval decision by 4:00 pm, it is his/her responsibility to contact the Smoke Program Coordinator to determine if burning is authorized.

3) Restrictions to burning may be issued: 1) statewide, 2) by individual Air Quality Basin(s) (see Appendix E), 3) by elevation within an Air Quality Basin; or 4) by portion of individual project.

4) The burn approval decision made by the Smoke Program Coordinator will be made using all available information regarding the prescribed burn, forecast meteorological conditions, and existing air quality. The criteria for making burn approval decisions include, but are not limited to:

- a) Analysis of the emissions from prescribed fires in progress and residual emissions from prescribed fires on a day-to-day basis;
- b) Analysis of emissions from active wildland fire used for resource benefits and consideration of potential long-term emissions estimates;
- c) Analysis of the emissions from wildland fires greater than 100 acres of timber, or 300 acres of brush (grass, brush, pinyon/juniper);
- d) Local burn conditions;
- e) Fire prescription including smoke management considerations from the applicable Burn Plan;
- f) Existing and predicted local air quality;
- g) Local and synoptic meteorological conditions;
- h) Type and location of areas to be burned;
- i) Protection of the national visibility goal for Class I Areas pursuant to 42 U.S.C. 7491 (a) (1);
- j) Minimization of smoke impacts in Class I Areas, roads or highways, airports, areas that are non-attainment for particulate matter (see Appendix E), carbon monoxide non-attainment areas, or other smoke-sensitive areas;
- k) Protection of the National Ambient Air Quality Standards (NAAQS) pursuant to 40 CFR Part 50; and
- l) Analysis of smoke transported from areas outside of Utah.

5) The burn approval decision made by the Smoke Program Coordinator can be rescinded at any time, as outlined in Section IX, Part A, Management of On-going Fires.

**E. Emission Reduction & Dispersion Techniques**

Each Land Manager conducting prescribed fires will implement as many emission reduction and dispersion techniques as feasible for individual prescribed fires. An evaluation of the emission reduction and dispersion techniques used for individual prescribed fires will be included in the Daily Emission Report submitted by Land Managers to the Smoke Program Coordinator at DAQ. The following emission reduction and dispersion techniques may be considered best smoke management practices:

- 1) Reducing biomass by use of techniques such as yarding or consolidation of unmerchantable material, multi-product timber sales or public firewood access, when economically or practically feasible, and providing information to the public on the adverse impacts of using green or wet wood as fuel;
- 2) Burning in seasons characterized by meteorological conditions that allow for good smoke dispersion;
- 3) Using mass ignition techniques such as aerial ignition by helicopter to produce high intensity fires with short duration impacts;
- 4) Igniting burns under good-to-excellent ventilation conditions and suspending operations under poor smoke dispersion conditions;
- 5) Considering smoke impacts and residual smoke on activities conducted by local communities and land users;
- 6) Burning only those wildland fuels essential to meet management objectives;
- 7) Minimizing duff consumption, smoldering, and large wildland fuel consumption through wildland fuel moisture considerations;
- 8) Minimizing dirt content when slash piles are constructed by using brush blades on material-moving equipment and by constructing piles under dry soil conditions or by using hand piling methods;
- 9) Burning piles when other burns are not feasible, such as when snow or rain is present;
- 10) Using opportunities that meet the burn prescription at all burn locations to spread smoke impacts over a broader time period and geographic area to minimize smoke impacts to protect public health, public safety and visibility;
- 11) Burning during optimum periods to prevent trapping smoke in inversions or diurnal wind flow patterns;
- 12) Consolidating burning material to enhance wildland fuel consumption and to minimize smoke production;
- 13) Implementing maintenance burning in a periodic rotation mimicking natural fire cycles to reduce excessive wildland fuel accumulations and subsequent excessive smoke production through smoldering or wildfire; and
- 14) Managing smoke impacts by: a) minimizing smoke impacts to roads, highways, and airports to the amounts, frequencies, and durations consistent with any guidance provided by highway and airport personnel; and b) minimizing smoke impacts to Class I Areas, areas that are non-attainment for particulate (see Appendix F), carbon monoxide non-attainment areas, or other smoke sensitive receptors.

**F. Daily Emission Report (Form 5) for Prescribed Fires Requiring Burn Plans**

By 0800 the day following the burn, Land Managers are required to submit a Daily Emission Report (see Form 5) for each day of significant prescribed fire activity (covering more than 50 acres) to the Smoke Program Coordinator at DAQ. The Daily Emission Report (Form 5) will be used by the Smoke Program Coordinator to generate an annual report of fire activities. If a burn is not carried out, the Daily Emission Report will be used the following morning by 0800 hours to document why a burn was not carried out. The report will include the following information:

- 1) The three-letter ID and project number consistent with Form 2;
- 2) Date submitted and by whom;
- 3) Burn start date and end date with time;
- 4) Emission information (black acres, tons fuel consumed per acre, tons particulate matter produced;
- 5) Public interest regarding smoke;
- 6) Daytime ventilation;
- 7) Nighttime smoke behavior;

8) Smoke management prescription or WFIP/Resource Benefit Fire Plan met; and

9) Emission reduction techniques applied.

10) Optional- dead and live fuel moisture information with average depth of fuels.

#### **G. Surveillance/Enforcement**

1) Land Managers conducting a prescribed fire will permit DAQ staff to enter and inspect burn sites before, during and after burns, to verify the accuracy of the permit or burn plan information and compliance with the burn plan, if appropriate. Site inspection procedures will be coordinated by the DAQ and the Land Manager for safety purposes prior to any site inspections.

2) All parties are committed to comply with the Clean Air Act and the best management practices available regarding emission production and reduction, and regional haze issues.

3) Failure to comply with the procedures and conditions specified in the permit or burn plan may result in an enforcement action, such as, a cease and desist order.

#### **H. Monitoring**

1) Land Managers will monitor effects of the prescribed fire on smoke sensitive receptors, and visibility in Class I Areas. Visual monitoring and documentation of the direction of the smoke plume may be performed using the Hourly Plume Observation Record (Form 6) or your agency equivalent, as needed. Monitoring of nuisance complaints by the public should be noted and recorded in the project file.

2) For large fires expected to last more than one day, or fires close to smoke sensitive receptors, locating real-time particulate matter monitors at smoke sensitive receptors may be warranted to facilitate timely response to smoke impacts. The DAQ will assist in identification of instrumentation, site selection, installation of instrumentation, operation, calibration, quality assurance, quality control, laboratory analysis, data interpretation and supplies. Current technology in the area of monitoring smoke particulates requires setup and calibration of equipment.

3) Land Managers will document information pertinent to prescribed fires requiring burn plans that leads to improved future operations and a better understanding of smoke accumulation problems, impacts, and solutions. This evaluation will be included in the Daily Emission Report that is submitted to the Smoke Program Coordinator at DAQ.

4) DAQ staff will forward to the Land Manager any complaint calls that are received as a result of smoke intrusions.

#### **VII. Requirements for Wildland Fires**

##### **Evaluation of Wildland Fire**

1) The Smoke Program Coordinator will review the daily situation report for Utah (prepared by the Eastern Great Basin Coordinating Center) to identify wildland fires on more than 100 acres of trees (timber) or 300 acres of brush (grass, brush, pinyon/juniper). Analysis of the emissions from wildland fires in progress and residual emissions from prescribed fires, wildland fire used for resource benefits, and wildland fires will be used to evaluate smoke impacts on air quality and visibility.

2) The Smoke Program Coordinator will review the daily situation report for Utah (prepared by the Eastern Great Basin Coordinating Center) to track emissions of particulate matter or other pollutants of interest from wildland fires for the emissions inventory database.

#### **VIII. Requirements for Wildland Fire Used for Resource Benefits (WFURBs)**

##### **A. Burn Approval Requirements for WFURBs**

1) Land Managers will notify the Smoke Program Coordinator at DAQ of any potential wildland fire used for resource benefits covering more than 20 acres. The following information will be provided:

a) Location of the fire (UTM Coordinate);

b) Active burning acres;

c) Probable fire size and daily anticipated growth in acres;

d) Type(s) of wildland fuel involved;

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e) An emergency telephone number that is answered 24 hours a day; and

f) Wilderness or Resource Natural Area designation, if applicable.

2) The Smoke Program Coordinator will be involved in the planning and decision process for on-going WFURBs. The following information will be submitted to the Smoke Program Coordinator as it is being developed (federal fire policy allows 48 hours):

a) Burn plan and anticipated emissions;

b) A map, preferably with a scale of 1:62,500, (see example in Appendix D) depicting both the daytime and nighttime smoke path and down-drainage flow for a minimum of 15 miles from the burn site with smoke-sensitive areas delineated; and

c) Additional computer smoke modeling, if requested by the Smoke Program Coordinator.

3) The Smoke Program Coordinator will then approve or disapprove the smoke management element of the WFIP/Resource Benefit Fire after consulting with the Land Manager and DAQ within 3 hours of receipt of the WFIP/Resource Benefit Fire information. This decision will be based on current prescribed fire, wildland fire, wildland fire used for resource benefits, forecast meteorological conditions, and existing air quality information using the criteria on page 10, Section VI.C.(4). Daily updates will be provided by the Land Manager to the Smoke Program Coordinator at DAQ if the fire is managed as a wildland fire used for resource benefits as long as the fire remains active (>20 acres/day).

### **B. Daily Emission Report for WFURBs**

By 0800 the day following significant activity of 50 acres or more, the Land Manager will submit the Daily Emission Report or equivalent (see Form 5) to the Smoke Program Coordinator at DAQ. The Daily Emission Report will be used by the Smoke Program Coordinator to make operational decisions for the scheduling of burns. The report will include the following information:

1) The three-letter ID, project number, Air Quality Basin, and name of Burn Boss;

2) Location (UTM Coordinate);

3) Dates of burn with 24 hour time (start day/time, end day/time);

4) Black acres by wildland fuel type;

5) Estimated wildland fuel consumption (%) by wildland fuel type;

6) Wildland fuel moisture (%) by size class;

7) Emission estimates using emission factors provided by DAQ;

8) Level of public interest/concern regarding smoke; and

9) Conformance to WFIP/Resource Benefit Fire Plan.

### **C. Monitoring**

1) Land Managers conducting wildland fires used for resource benefits will monitor effects of the prescribed fire on smoke sensitive receptors, and visibility in Class I areas, and conformance to WFIP/Resource Benefit Fire Plan. Monitoring of nuisance complaints by the public should be recorded in the project file.

2) Land Managers will document information pertinent to wildland fire used for resource benefits that leads to improved future operations and a better understanding of smoke accumulation problems, impacts, and solutions. This evaluation will be included in the Daily Emission Report that is submitted to the Smoke Program Coordinator at DAQ.

3) DAQ staff will forward to the Land Manager any complaint calls that are received as a result of smoke intrusions.

## **IX. Requirements for Prescribed Fires, Wildland Fire Used for Resource Benefits or Wildland Fires**

### **A. Management of On-going Fires (Prescribed Fires/WFURB)**

1) If it is determined by the Smoke Program Coordinator, in consultation with the DAQ and Land Manager(s), that the prescribed fire, wildland fire used for resource benefits, and/or smoke transported from other locations, is degrading air quality to levels that potentially could violate air quality standards and/or permit or burn plan conditions, the Land Manager(s) will promptly initiate actions to reduce or eliminate smoke production, by stopping ignition actions on existing prescribed fires and by curtailing additional prescribed or wildland fire used for resource benefit fires.

2) The Smoke Program Coordinator is required to provide documentation of air quality evaluation made for decision in A (1) above.

### **B. Public Notification/Education (Prescribed Fires/WFURB/Wildfires)**

1) The Land Managers and DAQ will be responsible for providing public notification and education related to the SMP, as needed. The public notification and education program will include smoke impacts from prescribed fires, wildland fire, and wildland fire used for resource benefits.

2) The Land Managers and DAQ will be responsible for providing public notification and education on the role of prescribed fire and wildland fire used for resource benefits to accomplish land management objectives.

3) The DAQ and National Weather Service will be responsible for issuing health advisories and forecast air quality alerts in accordance with existing state and federal laws as appropriate.

## **X. Program Management**

### **A. Form Processing and Submittal Times**

Smoke Management Plan forms will be available at [www.utahsmp.net](http://www.utahsmp.net) under the section titled "Required Forms". Preferably, all forms should be submitted through the home page submittal functions. A copy of the form should be kept by the Land Manager in case an error occurs and a fax is required. Until the system is totally functional, each Land Manager with a three-letter identifier will assign project numbers for tracking burns, and send updates to the Smoke Program Coordinator when updates to the list occur. In order to do so, each Land Manager will have to assign this responsibility to one person. If this is not possible, the Smoke Program Coordinator will assign the project numbers and fax the project numbers to the Land Manager. Submittal of the forms is as follows:

Form 1: Project Number (Optional)

Form 2: Utah Annual Burn Schedule Due by March 15 annually

Form 3: Pre-Burn Information Due two weeks before beginning ignition window

Form 4: Burn Request Submit two business days before planned ignition

Form 5: Daily Emission Report Submit by 0800 day following burn

Form 6: Hourly Plume Observation Record (Optional)

### **B. Updates to SMP Home Page**

Updates to the SMP home page will be routinely shown under the "What's New" section of the main page. Procedural changes will be highlighted to keep the page user friendly.

### **Utah Smoke Management Program Home Page Address**

[www.utahsmp.net](http://www.utahsmp.net)

### **Smoke Program Coordinator**

SMP Correspondence: Greg Zschaechner

Division of Air Quality

150 North 1950 West

Salt Lake City, Utah 84114-4820

[gzschaechner@worldnet.att.net](mailto:gzschaechner@worldnet.att.net)

*Timpanogos Cave National Monument – Fire Management Plan*

**(801) 539-4151 (phone)**

**(801) 536-0085 (fax)**

**BLM Office:** Greg Zschaechner  
BLM State Office  
P.O. Box 45155  
Salt Lake City, Utah 84145-0155  
gzschaechner@worldnet.att.net  
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(801) 539-4260 (fax)

**Utah Airshed Group**

Dennis Haddow	Frances Bernards
US Forest Service	Division of Air Quality
(303) 275-5759 (phone)	(801) 536-4056 (phone)
<a href="mailto:haddow_dennis/r2@fs.fed.us">haddow_dennis/r2@fs.fed.us</a>	fbernard@deq.state.ut.us
Linda Chappell	Dave Dalrymple
US Forest Service	Department of Natural Resources
(435) 896-1667 (phone)	(801) 538-5501 (phone)
<a href="mailto:lchappell/r4_fishlake@fs.fed.us">lchappell/r4_fishlake@fs.fed.us</a>	ddalrymp.nrsIf@state.ut.us
Arthur Latterell	John Shive
U.S. National Park Service	Bureau of Land Management
(435) 772-0188 (phone)	(435) 259-2113 (phone)
<a href="mailto:arthur_latterell@nps.gov">arthur_latterell@nps.gov</a>	<a href="mailto:jshive@ut.blm.gov">jshive@ut.blm.gov</a>

**Appendix G**  
**Wildland Fire Situation Analysis**

**WILDLAND FIRE SITUATION ANALYSIS** **STAGE 1**

Fire Name					
Fire Number					
Jurisdiction(s)					
Administrative Unit(s)					
FMP Unit(s)					
Geographic Area					
Management Code					
Start Date/Time					
Discovery Date/Time					
Current Date/Time					
Current Size					
Location:	Legal Description(s)	T.	R.	Sec.	Sub.
	Latitude				
	Longitude				
	UTM:				
	County:				
	Local Description				
Cause					
Fuel Model/Conditions					
Current Weather					
Predicted Weather					
Availability of Resources					

**DECISION CRITERIA CHECKLIST**

Decision Element

Yes

No

Is there a threat to life, property, or resources that cannot be mitigated?

Are potential effects on cultural and natural resources outside the range of acceptable effects?

Are relative risk indicators and/or risk assessment results unacceptable to the appropriate Agency Administrator?

Is there other proximate fire activity that limits or precludes successful management of this fire?

Are there other Agency Administrator issues that preclude wildland fire use?

The Decision Criteria Checklist is a process to assess whether or not the situation warrants continued wildland fire use implementation. A “Yes” response to any element on the checklist indicates that the appropriate management response should be suppression-oriented.

Recommended Response Action (check appropriate box)  
NO-GO (Initial attack/suppression action)

GO (Other appropriate management response)

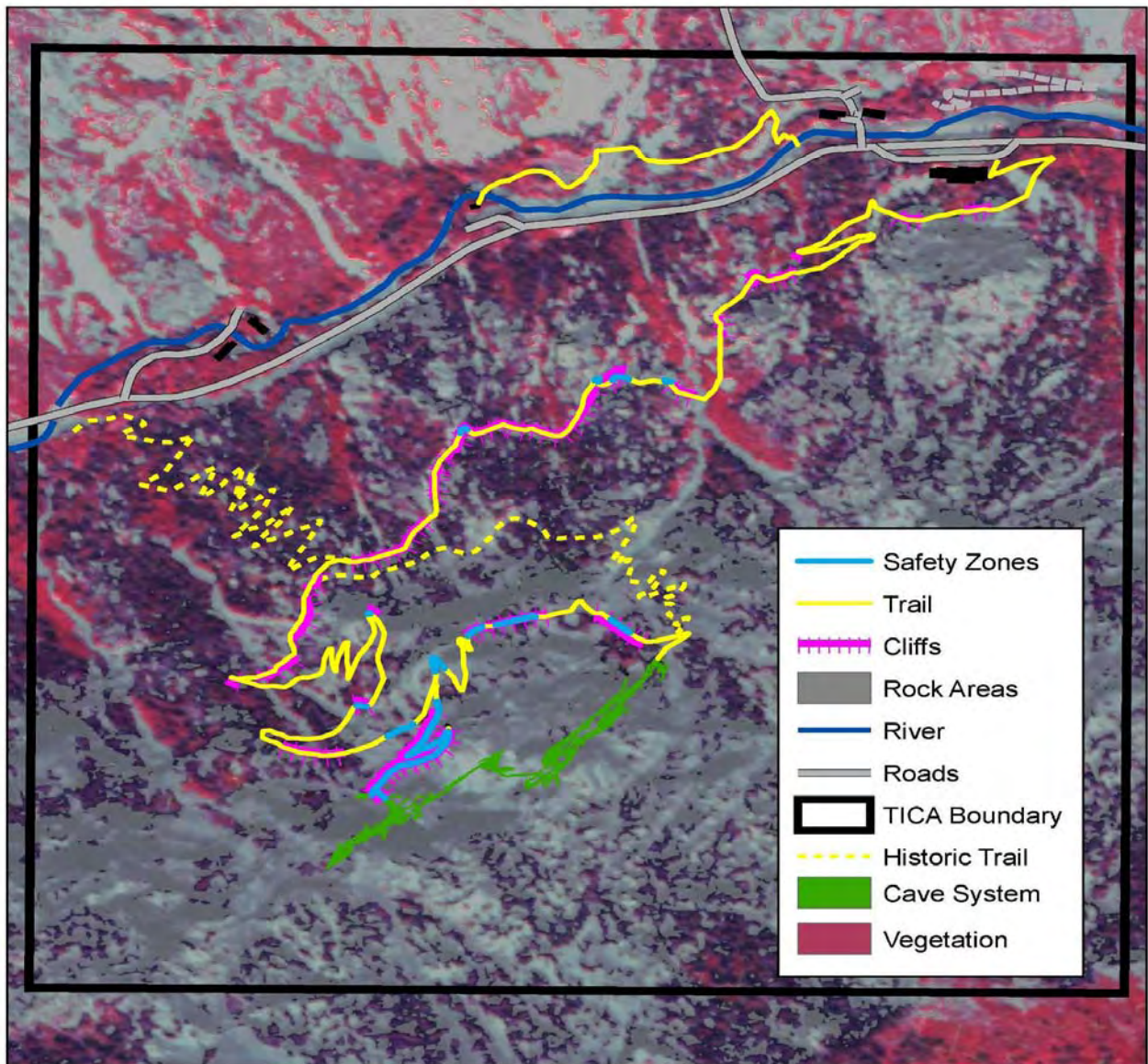
Signature

Date

---

Appendix H  
Pre-attack Fire Map

## PREATTACK INFORMATION



## **Appendix I**

### **Fire Prevention Plan**

The following are the primary objectives of the National Park Service wildland fire prevention/fire education program:

#### **OBJECTIVES**

1. To establish active wildland fire prevention/education programs at the national, regional, and park levels.
2. To develop and implement a Servicewide prevention analysis process.
3. To identify specific prevention alternatives in the fire management plan.
4. To integrate and coordinate wildland fire prevention/education programs with state foresters, adjacent land management agencies, and wildland fire protection organizations.

#### **RESPONSIBILITIES**

##### **Director:**

The Director of the National Park Service is responsible for assuring competent staff is available for:

1. Establishing Servicewide guidelines for wildland fire prevention analysis, planning, and implementation.
2. Establishing Servicewide guidelines for cooperative wildland fire prevention/education activities.
3. Providing Servicewide technical expertise and coordination in wildland fire prevention/education.
4. Assessing, coordinating, and facilitating wildland fire prevention/education training.
5. Participating as a member of the National Wildland Fire Coordinating Group's (NWCG) Wildland Fire Education Team or work closely with a selected representative.

6. Participating in national wildland fire prevention/education efforts or programs.

Regional Directors:

The regional directors are responsible for assuring competent staff is available:

1. Integrating wildland fire prevention/education into all management operations.
2. Coordinating the region-wide development of wildland fire prevention/education programs.
3. Coordinating activities with other land management agencies and wildland fire protection organizations at the state and regional level.
4. Providing technical expertise to individual park units and assessing, coordinating, and facilitating wildland fire prevention/education training.

Superintendents:

The superintendents are responsible for:

1. Supporting and encouraging employee involvement in wildland fire prevention/education programs.
2. Developing and implementing wildland fire prevention plans as a component of the fire management plan and/or the resources management plan.
3. Preparing wildland fire prevention plans, which shall be reviewed annually and updated as required.
4. Integrating wildland fire prevention/education into all management functions, including interpretation, visitor protection, maintenance, and administration.
5. Developing cooperative agreements and/or memoranda of understanding with local land management agencies and wildland fire protection groups to coordinate wildland fire prevention/education programs.
6. Assessing, coordinating, and facilitating local wildland fire prevention/education training.
7. Developing and providing prevention/education, which supports resource management, to the public.

## WILDLAND FIRE PREVENTION ANALYSIS

The scope and contents of the wildland fire prevention plan shall be based upon a wildland fire prevention analysis. The analysis shall be conducted as follows:

### Determination of Risks:

Risks are defined as any heat source or human activity that can result in wildland fire ignition. Risk assessment is the most important element of the analysis and is the foundation upon which the unit's fire prevention plan is built.

All potential ignition risks should be plotted on a topographic base map overlay of the unit (or in GIS). Risks to be plotted shall include all areas of concentrated use and incidents of human-caused fires for the past five- to ten-year period.

### Determination of Hazards:

Hazards are defined as the fuels and the topography on which a wildland fire will spread.

On a clear overlay of the base map (or in GIS), the areas of fuels and topography that present the greatest resistance to control, such as heavy fuels on steep slopes, should be encircled and labeled as "HIGH HAZARD" areas. Areas which present moderate resistance to control, such as medium concentrations of continuous fuels in less rugged topography, should be encircled and labeled as "MODERATE HAZARD" areas. Everything remaining will be labeled as "LOW HAZARD" areas.

### Determination of Values:

Values are defined as areas where losses from wildland fire would be unacceptable. Since the determination of values is subjective, they will be formulated through an interdisciplinary process.

Values may include cultural resource, developments, inholdings, sensitive habitats, endangered species, watersheds, nearby urban structures, and adjacent land.

On a separate overlay of the base map (or in GIS), encircle those areas of high and moderate value as determined by the interdisciplinary team. Label these as "HIGH VALUE" or "MODERATE VALUE" areas. Everything remaining will be labeled "LOW VALUE."

Additional information can be found in the Department of the Interior Wildfire Prevention Analysis and Planning Guide. Prevention Analysis software will be posted on the Internet at: <http://www.fire.org>, sometime during March 1999.

## WILDLAND FIRE PREVENTION PLAN

### Overview:

The prevention analysis will provide the manager with a tool to determine if a prevention problem exists. The manager will then decide what level of prevention, if any, is required for the park. The wildland fire prevention plan will be developed and implemented through education, engineering, and enforcement activities and is a component of the fire management plan.

The plan should identify fire prevention actions and programs needed to reduce the likelihood of ignitions in areas where wildland fire is unacceptable, and should also identify who is responsible for each activity and when each will be accomplished.

Technical direction for development of the wildland fire prevention plan will be based upon the National Park Service Wildland fire Prevention Handbook. Additional guidance can be found in NWCG Wildland fire Prevention Handbook 4, Chapter 20, Wildland fire Prevention Planning.

### Plan Implementation:

A guide, Wildfire Prevention Strategies (PMS-455) is available through the Publication Management System (NFES-1572) which provides suggestions for actions to take based upon the completed prevention analysis.

1. Education. Prevention programs utilize a variety of methods to inform the public of the need for wildland fire prevention. The specific activities are intended to create and maintain public and employee awareness, understanding, and support. It should be stressed in all public education efforts that a person causing a wildland fire could be held civilly liable for the cost of suppressing the wildland fire as well as being charged criminally.

- Printed Materials. Printed materials, including general information handouts, site bulletins, and park brochures, should include a wildland fire prevention message. The Department of the Interior Fire Education Team materials are available, as well as Smokey Bear materials through the Fire Prevention Catalog cache from the Cooperative Forest Fire Prevention Program in Grand Rapids, Minnesota.
- Media. Media campaigns should be initiated which include show-me tours, photo opportunities, and demonstrations and which solicit support for public assistance in

wildland fire prevention/education programs. The park should develop public service announcements and media releases for use by all mass media outlets. Where park Traveler Information Systems (TIS) exist, wildland fire prevention messages should be included which inform visitors of current fire conditions or visitor use and access restrictions.

- Signs and Posters. Appropriately located signs and posters with carefully worded prevention messages are effective. Signs and posters at entrance stations provide an excellent opportunity to alert visitors about local wildland fire conditions and any restrictions. Technical information concerning types of signs and posters can be obtained in NWCG Fire Prevention Handbook 4, Chapter 40.
  - Visitor Services and Facilities. Wildland fire prevention/education information can be integrated into existing visitor service and interpretive presentations, posted on bulletin boards, and used in temporary exhibits. The Department of Interior (National Interagency Fire Center) has tabletop and freestanding displays on the role of fire that can be used upon request to the NIFC External Affairs Office.
  - Personal Contacts. Park, cooperating association, and concession staffs play an important role in communicating the wildland fire prevention/education message in all personal contacts.
  - Internal Communications. Park personnel and concessionaires shall be aware of wildland fire prevention/education procedures and communicate these to the public. Internal newsletters, bulletin board postings, in-park training programs, and tail-gate sessions all provide excellent opportunities to communicate fire prevention/education messages.
  - Outreach Programs. Wildland fire prevention/education messages should be incorporated into off-site programs presented to schools, civic groups, and other organizations. Fire prevention/education information can also be presented at on-site workshops, seminars, and other educational programs. Park residents, inholders, and neighbors can get valuable information on protecting their homes by visiting the (Firewise) website at <http://www.firewise.org/>.
2. Engineering. Wildland fire prevention engineering is the process of reducing risks and hazards by shielding or removing heat sources, or by removing fuels.

Prevention engineering includes activities such as moving fuel away from roadways, removing vegetation from around a structure, creating firebreaks around campgrounds, and using spark arresters on internal combustion engines and fireplaces. Prescribed fire can be used to reduce fuels, thereby minimizing the threat of ignition or fire spread.

Technical information on other engineering areas such as power lines, rights-of-ways, and industrial activities can be found in NWCG Wildland Fire Prevention Handbook 4, Chapter 50.

### 3. Enforcement.

- Visitor Use Regulation. Wildland fire prevention enforcement should be practiced at the minimum level necessary (as defined in RM-9, Law Enforcement Guideline) to gain compliance with fire laws and regulations. The Superintendent's compendium shall include elements to implement the fire prevention plan. Those sections of Title 36, CFR, which concern fire prevention shall be emphasized.
- The inadvertent or intentional ignition of wildland fuels by humans is a crime. All wildland fires will be investigated at the earliest possible time. The investigation may range from a documented determination of cause by the initial attack fire crew to criminal investigation by a qualified arson investigator.

The primary job in investigation will be to obtain all the information and evidence possible to identify the responsible party. The initial actions by the fire crew on the fire will affect the investigation's chance for success. Every initial attack fire fighter needs to receive some minimal training in finding and protecting the point of origin of any fire. They must also understand how to protect the point of origin and any possible evidence. Much of this is covered in the Wildland Fire Cause Determination Handbook of the NWCG.

All violators will be held liable for civil costs and for appropriate criminal action when laws or regulations have been violated.

Cash awards from appropriated funds are authorized to be paid upon arrest and conviction of known arsonists from suppression funds. The option to offer these rewards must be coordinated through the Regional FMO and local law enforcement agencies.

Public Use Restrictions. The Superintendent has the authority to impose public use and access restrictions in times of high fire danger (36 CFR 1.5) (<http://squid.law.cornell.edu/cgi-bin/get-cfr.cgi?TITLE=36&PART=1&SECTION=5&TYPE=TEXT>). These public use restrictions could include:

- 1) Restricted fire use, i.e., no fires outside developed sites, no fires in backcountry, etc.

- 2) Restriction of public use activities, i.e., off-road vehicles, backcountry access, etc.
- 3) Restriction of park operations or contract activities, i.e., construction blasting, chain saw use, etc.
- 4) Total or partial closure of unit.

### SPECIAL WILDLAND FIRE EMPHASIS PROGRAMS

Special emphasis programs are new or on-going programs which can be instituted at all organizational levels. These would include:

#### NWCG and Department of the Interior Wildland Fire Prevention/Education Programs:

As part of the National Wildfire Coordinating Group, the Fire Education Working Team provides fire education and prevention expertise on national issues. The National Park Service has a representative on this working team for input on initiatives and dissemination of information.

The Interior agencies have not established a formal working group for prevention and fire education, but specialists work together closely in developing and funding such issues. The National Park Service is an integral part of this.

Fire education is handled as the Fire Management Program Center by the Fire Education and Information Specialist. At the park level, the fire management staff often coordinates with interpretive staff and information officers on fire education issues. Prevention analysis and prevention programs are under fire operations at the national office. Prevention at the park level is provided by the fire management staff.

#### Cooperative Forest Fire Prevention (CFFP)/Smokey Bear Program:

Full details on all facets of the Smokey Bear Program can be found in NWCG Handbook 4, Chapter 40.

#### Wildland-Urban Interface:

The wildland-urban interface is an increasing national problem affecting all agencies. The encroachment of structures and developments into rural areas has made fire suppression and fire prevention/education activities much more complex. Prevention/education activities that can be effective in urban interface areas include:

1. Fuels Modification. Flammable vegetation should be cleared for 30 feet around structures, but clearance requirements may be greater in areas where slopes and heavy fuels are involved. Woodpiles and other flammable materials should be stored away from the structure.
2. Construction Materials. Structures with wood roofs and sidings are much more vulnerable to wildland fire ignition. Developers and homeowners should be encouraged to install noncombustible roof materials when possible.
3. Roofs and Chimneys. Chimneys should be equipped with spark arresters of no more than ½" non-combustible screens. Roofs should be kept clear of leaves and needles.
4. Access. Access roads to structures should be cleared sufficiently to allow fire trucks safe access and exit. It is always desirable to have two separate routes of access.
5. Water. A good water supply is critical. In areas where water flow is low, an auxiliary water tank with pump may be necessary.
6. Open-Flame Sources. Incinerators, barbecues, welders, and similar open-flame sources should have sufficient clearances from flammable vegetation. A hose and shovel should be kept nearby when burning is underway.

Volunteers in Wildland Fire Prevention. Volunteers can be used in wildland fire prevention/education in compliance with RM-7, the Volunteers in Park Guidelines. Volunteers may be utilized in traditional fashion or in wildland fire prevention/education programs.

### **XIII. WILDLAND FIRE PREVENTION/EDUCATION TRAINING**

All National Park Service personnel have wildland fire prevention/education responsibilities. To insure employees have a basic understanding of wildland fire prevention/education, all NPS employees should complete Introduction to Wildland Fire Prevention. This basic course is available for purchase through the Publication Management System (NFES-2114).

#### WILDLAND FIRE PREVENTION POSITIONS/FUNDING.

Upon completion of the Prevention Planning process and its approval and addition to the Fire Management Plan, positions or funding may be justified to achieve identified and realistic goals. Any request from FIREPRO funding will only be considered when the approved Fire Management Plan documents the need.

### INTERAGENCY COOPERATION

Interagency cooperation is critical at all levels. Wildland fire prevention/education programs can be much more effective when resources and programs are coordinated and shared among agencies. Careful coordination is needed so programs are complimentary and reinforce, rather than contradict, each other.

Cooperative wildland fire prevention/education programs should include the establishment of interagency committees, the development of interagency public education programs, and the development and coordinated release of news stories to the media.

The promotion of wildland fire prevention/education should be strongly considered. Cooperative efforts in wildland fire prevention/education activities, with other local fire authorities, provide an excellent avenue for establishing cordial relationships, which pay dividends at the time of an emergency.

**Appendix J**  
**Categorical Exclusion Reference**

TICA categorical exclusion (TICA CE. #1.12)

“Hazardous fuels reduction activities using prescribed fire not to exceed 4,500 acres, and mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing, not to exceed 1,000 acres. Such activities:

- Shall be limited to areas (1) in wildland-urban interface and (2) Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside the wildland urban interface;
- Shall be identified through a collaborative framework as described in “A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan;”
- Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans;
- Shall not be conducted in wilderness areas or impair the suitability of wilderness study areas for preservation of wilderness;
- Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and may include the sale of vegetative material if the primary purpose of the activities is hazardous fuels reduction.”

## INTERMOUNTAIN REGION ENVIRONMENTAL SCREENING FORM

*This form must be attached to all documents sent to the regional director's office for signature. Sections A and B should be filled out by the project initiator (may be coupled with other park project initiation forms). Sections C-I are to be completed by the interdisciplinary team members. Although you may modify this form to fit your needs, you must ensure that the form includes information detailed below and must have your modifications reviewed and approved by the regional environmental coordinator.*

### A. PROJECT INFORMATION

Park Name Timpanogos Cave National Monument

Project Number

Project Type (Check): ☐ Cyclic ☐ Cultural Cyclic ☐ Repair/Rehab ☐ ONPS  
☐ NRPP ☐ CRPP ☐ FLHP  
☐ Line Item ☐ Fee Demo ☐ Concession Reimbursable  
☒ Other (specify) Fire Management Plan

Project Location Timpanogos Cave National Monument

Project Originator/Coordinator Mike Gosse

Project Title Implement a Fire Management Plan for Timpanogos Cave National Monument

Administrative Record Location Superintendent's Office

Administrative Record Contact Superintendent

### B. PROJECT DESCRIPTION/LOCATION *[To begin the statutory compliance file, attach to this form, maps, site visit notes, agency consultation, data, reports, categorical exclusion form (if relevant), or other relevant materials.]*

Preliminary drawings attached? ☐ Yes ☒ NoBackground info attached? ☐ Yes ☒ No

Date form initiated Dec 1, 2004

Anticipated compliance completion date Dec 31, 2004

Projected advertisement/Day labor start

Construction start

Is project a hot topic\*? ☐ Yes ☒ NoSHPO Log No (**NM only**)

(\*controversial or sensitive issues that should be brought to the Regional Director's attention)

The Department of the Interior and Department of Agriculture jointly published two fire management categorical exclusions on June 5, 2003, in the *Federal Register* (vol 68, No. 108, Pages 33814-33824). The public raised no substantive comments during the comment period, and the National Park Service proceeded with the use of the categorical exclusions for fire management plans in units of the national park system that clearly meet the criteria. The public and interested agencies will be notified of the National Park Service's decision to use categorical exclusions for qualifying fire management plans.

The Fire Management Plan for Timpanogos Cave National Monument details, among other things, the means by which full fire suppression, no prescribed burning, and limited mechanical fuels reduction with no pile burning will be conducted. No controversial or sensitive issues were identified during the development of the plan. This plan meets the criteria for the above referenced fire management plan categorical exclusions.

## Appendix K - Environmental Screening Form

DESIRED CONDITIONS – Timpanogos Cave National Monument’s Fire Management Plan stems from the following broad desired conditions:

### SAFETY

- Firefighter and public safety are the highest priority.
- Every fire management activity complies with established fire-safe management practices.
- Unwanted fires are prevented and suppressed using effective strategies and methods under the decision process of sound risk management.

### CULTURAL RESOURCES

- The fire management program protects, preserves, and interprets the cultural and natural resources of Timpanogos Cave National Monument.
- Fire management staff collaborates with appropriate resource management staff to seek information and technical expertise to identify cultural and natural resource preservation and protection needs.
- Fire suppression activities do not negatively impact cultural resources.

### VEGETATION MANAGEMENT

- Ecological principles are applied to ensure that natural resources are maintained and not impaired.
- Ecologic processes, including fire and fire fuels management, shape vegetative patterns and conditions.
- Vegetation succession reflects the natural range of variability under conditions that would occur normally at Timpanogos Cave National Monument.
- Fire or fire fuels management does not contribute or promote the spread of invasive weeds.

### WILDLIFE

- Native wildlife habitat is maintained or enhanced through practices that are consistent with natural processes.
- Mechanical fuels reduction is used as a tool to prevent unnatural catastrophic fires, which result from high fuel loads and denser vegetation and may adversely affect wildlife habitat.

### AIR QUALITY

- Fire management activities are consistent with the Utah Smoke Management Plan and State Implementation Plan.

### VISITOR EXPERIENCE

- A safe visitor experience occurs during and after fire fuels management activities.
- Visitors have an enjoyable and meaningful experience and the opportunity to understand the ecological, cultural, and aesthetic values of fire and fire fuels management.

### PARK NEIGHBORS AND PARTNERS

- Local governments, park neighbors, interagency cooperators, and the public work collaboratively with the park to implement fire management program objectives and to foster a spirit of cooperation.

### FIRE MANAGEMENT PROGRAM GOALS

The vegetation at Timpanogos Cave National Monument differs from what existed in 1887 when the first cave was discovered. A much greater concentration of non-native species now exists. The goals of the fire and fire fuels management program are to:

- Provide for employee, public, and firefighter safety,
- Re-establish the natural vegetative regime,
- Reduce the extent of exotic plants,
- Preserve and protect park cultural and natural resources and facilities.

Director’s Order #18, section 5.2.a., states, “Every park area with burnable vegetation must have a fire management plan approved by the Superintendent.” The fire management plan addresses this directive plus recent fire management policy adjustments expressed in the 2000 Interagency Fire Policy Review. It also incorporates the 2000 Utah Smoke Management Plan, State Implementation Plan, and new knowledge regarding the park’s natural and cultural resources. The plan will remain in effect 10 years or longer, during which time annual updates will occur.

## Appendix K - Environmental Screening Form

### Project Description:

The Timpanogos Cave National Monument Fire Management Plan contains consideration for the use of suppression and manual treatments (mechanical) as components for fire and fire fuels management in the park. The plan establishes a single fire management unit based upon fire danger, natural barriers to fire spread, safety of suppression forces, and adjacent land ownership. Because of the nearly vertical terrain of most of the monument's 250 acres, control and management of prescribed fire would be excessively costly and may not be possible, or safe at any price. Therefore, the use of fire as a fire management tool is not proposed in the Timpanogos Cave National Monument Fire Management Plan.

### Suppression

All wildland fire suppression activities provide for firefighter and public safety as the highest consideration, but also minimize the loss of resource values, economic expenditures, and/or the use of critical firefighting resources. The appropriate management response would be used to curtail fire spread and eliminate all identified fire threats. Appropriate management response could include: aggressive suppression, full suppression, or confine and contain strategies. For suppression actions, holding actions could be implemented to prohibit the fire from crossing containment boundaries. Holding actions could include the construction of fire lines, reduction of excessive fuel concentrations, and creation of fuel breaks or barriers around critical or sensitive sites or resources.

Full suppression actions would include all available tools and tactics to suppress the fire. This could include the use of fire retardant and any aviation resources that could be used in an appropriate situation. In rare situations or events the use of bulldozers, graders, tractors or other heavy equipment could be used on the very limited terrain where they could function, but only after approval on a case-by-case basis by the Superintendent.

A confine/contain strategy could be used to create a fuel break around the fire. This break may include natural barriers or manually and/or mechanically constructed lines. Active fire suppression actions would probably not be implemented in areas where the fire could be confined or contained within this pre-designated area. Aircraft could be used for fire management activities including: reconnaissance, fire control, or retardant drops.

### Mechanical

Mechanical equipment could be used as a stand-alone method to reduce fuels, or to construct a fire line during a wildland fire.

Mechanical methods could include:

- non-mechanized handheld tools used in suppression activities (e.g., shovels, saws, axes, pulaskis),
- mechanized handheld tools (e.g., chainsaws, brush cutters, weed trimmers), or
- mechanized wheeled or track equipment (e.g., bushhogs, fella-bunchers, tractors, loaders, mowers, or other similar equipment that are designed for large fuel removal). Mechanized wheeled or track equipment could be used in wildland urban interface areas, along park boundaries, and in developed infrastructure areas within the park.

Heavy equipment with large tires or tracks designed to have less ground disturbances would be the first choices for use. The use of any heavy ground disturbing equipment would need to be approved by the Superintendent.

### Herbicide

Herbicide treatments will not be used as a method to treat hazardous fire fuels.

## Appendix K - Environmental Screening Form

### **C. RESOURCE EFFECTS TO CONSIDER** *(Tailor the following to meet individual park/unit project needs.)*

*Please see section F (Instructions for Determining Appropriate NEPA Pathway) prior to completing this section. Also, use the process described in DO-12, §2.9 and §2.10; §3.5; §4.5(G) to (G)(5) and §5.4(F) to help determine the context, duration and intensity of effects on resources.*

Are any impacts possible on the following physical, natural or cultural resources?	Yes	Level of Effect	No	Data Needed to Determine
1. Geological resources – soils, bedrock, streambeds, etc.			<b>X</b>	
2. From geohazards			<b>X</b>	
3. Air quality			<b>X</b>	
4. Soundscapes			<b>X</b>	
5. Water quality or quantity			<b>X</b>	
6. Streamflow characteristics			<b>X</b>	
7. Marine or estuarine resources			<b>X</b>	
8. Floodplains or wetlands			<b>X</b>	
9. Land use, including occupancy, income, values, ownership, type of use			<b>X</b>	
10. Rare or unusual vegetation – old growth timber, riparian, alpine			<b>X</b>	
11. Species of special concern (plant or animal; state or federal listed or proposed for listing) or their habitat			<b>X</b>	
12. Unique ecosystems, biosphere reserves, World Heritage Sites			<b>X</b>	
13. Unique or important wildlife or wildlife habitat			<b>X</b>	
14. Unique or important fish or fish habitat			<b>X</b>	
15. Introduce or promote non-native species (plant or animal)			<b>X</b>	
16. Recreation resources, including supply, demand, visitation, activities, etc.			<b>X</b>	
17. Visitor experience, aesthetic resources			<b>X</b>	
18. Cultural resources including cultural landscapes, ethnographic resources, sacred sites			<b>X</b>	
19. Socioeconomics, including employment, occupation, income changes, tax base, infrastructure, concessions			<b>X</b>	
20. Minority and low income populations, ethnography, size, migration patterns, etc.			<b>X</b>	
21. Energy resources			<b>X</b>	
22. Other agency or tribal land use plans or policies			<b>X</b>	
23. Resource, including energy, conservation potential			<b>X</b>	
24. Urban quality, gateway communities, etc.			<b>X</b>	
25. Long-term management of resources or land/resource productivity			<b>X</b>	
26. Pollution prevention (greening the parks)			<b>X</b>	
27. Wilderness – suitability, recommended, potential, designated			<b>X</b>	
28. Park operations			<b>X</b>	
29. Other important environmental resources (e.g. geothermal, paleontological resources, night skies)?			<b>X</b>	

## Appendix K - Environmental Screening Form

### D. Mandatory Criteria

Mandatory Criteria: If implemented, would the proposal:	Yes	No	Comment	Data Needed to Determine
A. Have material adverse effects on public health or safety?		<b>X</b>		
B. Have adverse effects on such unique characteristics as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands; floodplains; or ecologically significant or critical areas, including those listed on the National Register of Natural Landmarks?		<b>X</b>		
C. Have highly controversial environmental effects?		<b>X</b>		
D. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?		<b>X</b>		
E. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?		<b>X</b>		
F. Be directly related to other actions with individually insignificant, but cumulatively significant, environmental effects?		<b>X</b>		
G. Have adverse effects on properties listed or eligible for listing on the National Register of Historic Places?		<b>X</b>		
H. Have adverse effects on species listed or proposed to be listed on the List of Endangered or Threatened Species or have adverse effects on designated Critical Habitat for these species?		<b>X</b>		
I. Require compliance with Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), or the Fish and Wildlife Coordination Act?		<b>X</b>		
J. Threaten to violate a federal, state, local, or tribal law or requirement imposed for the protection of the environment?		<b>X</b>		
K. Involve unresolved conflicts concerning alternative uses of available resources (NEPA sec. 102(2)(E))?		<b>X</b>		
L. Have a disproportionate, significant adverse effect on low-income or minority populations (EO 12898)?		<b>X</b>		
M. Restrict access to and ceremonial use of Indian sacred sites by Indian religious practitioners or adversely affect the physical integrity of such sacred sites (EO 130007)?		<b>X</b>		
N. Contribute to the introduction, continued existence, or spread of federally listed noxious weeds (Federal Noxious Weed Control Act)?		<b>X</b>		
O. Contribute to the introduction, continued existence, or spread of non-native invasive species or actions that may promote the introduction, growth or expansion of the range of non-native invasive species (EO 13112)?		<b>X</b>		
P. Require a permit from a federal, state, or local agency to proceed, unless the agency from which the permit is required agrees that a CE is appropriate?		<b>X</b>		
Q. Have the potential for significant impact as indicated by a federal, state, or local agency or Indian tribe?		<b>X</b>		
R. Have the potential to be controversial because of disagreement over possible environmental effects?		<b>X</b>		
S. Have the potential to violate the NPS Organic Act by impairing park resources or values?		<b>X</b>		

### E. OTHER INFORMATION *(Please answer the following questions/provide requested information.)*

Are personnel preparing this form familiar with the site? ☒ Yes ☐ No

Did personnel conduct a site visit? ☐ Yes ☒ No *(If yes, attach meeting notes noting when site visit took place, who attended, etc.)*

Is the project in an approved plan such as a General Management Plan or an Implementation Plan with an accompanying environmental document? ☐ Yes ☒ No

If so, plan name \_\_\_\_\_

Is the project still consistent with the approved plan? ☐ Yes ☐ No *(If no, prepare plan/EA or EIS.)*

Is the environmental document accurate and up-to-date? ☐ Yes ☐ No *(If no, prepare plan/EA or EIS.)*

FONSI ☐ ROD ☐ *(Check one)* Date approved \_\_\_\_\_

Are there any interested or affected agencies or parties? ☐ Yes ☒ No

Did you make a diligent effort to contact them? ☐ Yes ☐ No

## Appendix K - Environmental Screening Form

Has consultation with all affected agencies or tribes been completed? ☐ Yes ☒ No

(If so, attach additional pages detailing the consultation, including the name, the dates, and a summary of comments from other agencies or tribal contacts.)

Are there any connected, cumulative, or similar actions as part of the proposed action? ☐ Yes ☒ No

(If so, attach additional pages detailing the other actions.)

### F. INSTRUCTIONS FOR DETERMINING APPROPRIATE NEPA PATHWAY

First, always check DO-12, § 3.2, "Process to Follow" in determining whether the action is categorically excluded from additional NEPA analyses. Other sections within DO-12, including §2.9 and 2.10; §3.5; §4.5(G)(4) and (G)(5), and §5.4(F), should also be consulted in determining the appropriate NEPA pathway. Complete the following tasks: conduct a site visit or ensure that staff is familiar with the site's specifics; consult with affected agencies, and/or tribes; and interested public and complete this environmental screening form.

If your action is described in DO-12 section 3.3, "CE's for Which No Formal Documentation is Necessary," follow the instructions indicated in that section. If your action is not described in DO-12, section 3.3, and IS described in section 3.4, AND you checked yes or identified "data needed to determine" impacts in any block in section D (Mandatory Criteria), this is an indication that there is potential for significant impacts to the human environment, therefore, you must prepare an EA or EIS or supply missing information to determine context, duration and intensity of impacts.

If your action is described in section 3.4 and NO is checked for all boxes in section D (Mandatory Criteria), BUT you have initially checked "yes" in section C (Resource Effects to Consider) during internal scoping, this means that the team should do additional analyses to determine the context, duration and intensity of effects. If the magnitude of effects is then determined to be at the negligible or minor level, then usually there is no potential for significant impacts, then an EA or EIS is not required. If, however, during internal scoping and further investigation, resource effects still remain unknown, or are at the minor to moderate level of intensity, and the potential for significant impacts may be likely, an EA or EIS is required.

**In all cases, data collected to determine the appropriate NEPA pathway must be included in the administrative record.**

### G. INTERDISCIPLINARY TEAM SIGNATORY (All interdisciplinary team members must sign.)

By signing this form, you affirm the following: you have either completed a site visit or are familiar with the specifics of the site; you have consulted with affected agencies and tribes; and you, to the best of your knowledge, have answered the questions posed in the checklist correctly.

Interdisciplinary Team Leader Name	Field of Expertise	Date Signed
Mike Gosse	Chief Ranger	12/3/2004
Technical Specialists Names	Field of Expertise	Date Signed
Jon Jasper	Resource Management Specialist	12/3/2004

### H. This section may be filled out either as the project progresses or when environmental documentation is complete.

National Environmental Policy Act Data entered by: Jon Jasper, Resource Management Specialist

(Choose one and fill in blanks)

- |                                     |     |   |                       |                                 |
|-------------------------------------|-----|---|-----------------------|---------------------------------|
| <input checked="" type="checkbox"/> | CE  | Complete sections A-F before checking this box. | B(4)                  | CE Citation (from 3-4 of DO-12) |
| <input type="checkbox"/>            | EA  | Public scoping date _____                       | IMR Review date _____ |                                 |
|                                     |     | EA release to public _____                      | FONSI date _____      |                                 |
| <input type="checkbox"/>            | EIS | NOI in FR _____                                 | NOA for DEIS _____    |                                 |
|                                     |     | NOA for FEIS _____                              | ROD date _____        |                                 |

## Appendix K - Environmental Screening Form

Will the EA/EIS be used as the §106 compliance document? ☐ Yes ☒ No If yes, you must notify *in advance* the SHPO/THPO and ACHP of your intent to do so. Date notified \_\_\_\_\_

### National Historic Preservation Act

Data entered by: Jon Jasper, Resource Management Specialist

Has the area been surveyed and NRHP resources identified? ☐ Yes ☒ No

Archeological resources affected? ☐ Yes ☒ No

Historic structures affected? ☐ Yes ☒ No

Cultural landscapes affected? ☐ Yes ☒ No

Ethnographic resources affected? ☐ Yes ☒ No (If yes, interested parties contacted? ☐ Yes ☐ No)

Choose one for determination of effect on NRHP properties:

☒ No Historic Properties Affected

Date to SHPO/THPO \_\_\_\_\_

☒ No Adverse Effect

☐ Programmatic Exclusion (Exclusion # \_\_\_\_\_)

If using combined EA/AEF/ESF, date letter to SHPO/THPO declaring intention to use combined document. \_\_\_\_\_

Date AEF/ESF or combined EA/AEF to SHPO/THPO \_\_\_\_\_

Date response from SHPO/THPO \_\_\_\_\_

Date mitigation completed \_\_\_\_\_

☐ Adverse Effect

If using combined EA/AEF, date letter to SHPO/THPO declaring intention to use combined document. \_\_\_\_\_

Date AEF/ESF or combined EA/AEF to SHPO/THPO \_\_\_\_\_

Date to ACHP, if required \_\_\_\_\_

MOA Date \_\_\_\_\_

Date mitigation completed \_\_\_\_\_

### Endangered Species Act

Data entered by: Jon Jasper, Resource Management Specialist

Any threatened/endangered species in area? ☐ Yes ☒ No

If species in area ☐ No effect ☐ Not Likely to Adversely Affect ☐ Likely to Adversely Affect  
(If checked, consider EIS)

Date to FWS \_\_\_\_\_

Date FWS response \_\_\_\_\_

### Floodplains/Wetlands/§404 Permits

Data entered by: Jon Jasper, Resource Management Specialist

Is project in 100- or 500-year floodplain, flash flood hazard area, or wetlands?

☐ Yes ☒ No

If yes, statement of findings approval date \_\_\_\_\_

404 permit needed?

☐ Yes ☒ No

Date \_\_\_\_\_

State 401 certification?

☐ Yes ☒ No

Date \_\_\_\_\_

*Note: If 404 permit needed, so is 401 permit*

State Water Quality permit?

☐ Yes ☒ No

Date \_\_\_\_\_

Tribal Water Quality permit?

☐ Yes ☒ No

Date \_\_\_\_\_

CZM Consistency determination needed?

☐ Yes ☒ No

Date \_\_\_\_\_

### Other Permits/Laws

Data entered by: Jon Jasper, Resource Management Specialist

Consistent with Wilderness Act

☐ Yes ☐ No ☒ N/A

Date \_\_\_\_\_

Wilderness minimum requirement  
(tool) decision needed?

☐ Yes ☒ No

Date \_\_\_\_\_

Wild and scenic river concerns?

☐ Yes ☒ No

Date \_\_\_\_\_

## Appendix K - Environmental Screening Form

National Trails concerns?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Date _____
Air Quality consult w/State?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Date _____
Consistent w/Architectural Barriers, Rehabilitation, and Americans with Disabilities Acts?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Date _____
Other _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Date _____

### I. MITIGATING MEASURES TO BE INCLUDED IN PROJECT:

*(Specify here or attach appropriate pages from EA, EIS, FONSI, MOA, or ROD)*

The following constraints apply to all wildland fire operations unless specifically excepted:

- Due to the terrain in the monument, there are very few locations where fire line could be constructed using heavy equipment. If fire line is to be constructed, the Superintendent must approve the use of any dozers or heavy ground disturbing equipment. Generally, they will not be used except for the defense of primary structures such as the historic rock house, residences and the Mission 66 maintenance building.
- The only archeological site in the monument is a rock outcrop. The site will not be disturbed if fire line needs to be built.
- Fire line may be built in the historic district to protect historic structures or if necessary protect human life.
- The Superintendent must approve construction of any fire lines.
- Due to the steep and rugged terrain in the monument off road use of vehicles is not possible, or not safe. For this reason engines and vehicles will not operate off-road unless approved by the Superintendent.

### J. SUPERVISORY SIGNATORY

*Based on the environmental impact information contained in the statutory compliance file and in this environmental screening form, environmental documentation for the Timpanogos Cave National Monument Fire Management Plan is complete. The Fire Management Plan does not involve hot topics or sensitive issue.*

Recommended:

Compliance Specialist	Telephone Number	Date

Approved:

Superintendent	Telephone Number	Date

SHPO Concurrence (NM only):

Name/Title	Telephone Number	Date

**Appendix L**  
**Decision Document**

**RECORD OF CATEGORICAL EXCLUSION**

Approval and Implementation of  
Fire Management Plan  
Timpanogos Cave National Monument  
Utah County, Utah

Background

Timpanogos Cave National Monument is a unit of the Department of the Interior (DOI), National Park Service (NPS). Timpanogos Cave is located in Utah County, Utah about 30 miles south of Salt Lake City and 15 miles north of Provo. Situated in American Fork Canyon along the Wasatch Front, the monument is adjacent to the urban center of the state. Established under Presidential Proclamation on October 14, 1922 the monument was set aside for its unusual scientific interest and importance, and because proper protection of the caves serves the public interest. At Timpanogos Cave National Monument, the National Park Service preserves the outstanding cave formations, geological processes, and historical values of the Timpanogos Cave system and associated features for the recreational and educational enjoyment, scientific value, and inspiration of this and future generations.

The monument consists of 250 acres in the steep and narrow American Fork Canyon and is divided by the American Fork River. Composed of limestone karst the monument is defined by vertical cliffs, rock spires, and scree slopes. Vegetated by mixed conifer forest on the north-facing slope, juniper and oak scrub on the south-facing slope, and cottonwood-willow-box elder in the riparian zone, the monument is typical of lower elevation canyons in the Wasatch Mountains.

Purpose of and Need for Action

An interdisciplinary team at Timpanogos Cave National Monument has developed a Fire Management Plan for the monument and has proposed the plan for adoption and implementation. The purpose of the Timpanogos Cave National Monument Fire Management Plan is to protect human life and health, protect private and public property, and to assure the health and protection of monument resources. The plan includes the following goals:

- Assure public, employee, and firefighter safety.
- Manage wildland fires in concert with federal, state, and local air quality regulations.
- Use the appropriate management response to suppress fire and prevent its spread onto adjacent private and public lands while protecting resources.
- Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with cooperator fire management agencies within and outside the Eastern Great Basin.
- Reduce wildland fire hazard around developed areas and cultural and historic resources.

Timpanogos Cave National Monument needs a Fire Management Plan to guide the monument's fire program. The monument does not have a Fire Management Plan that meets current Department and NPS requirements. National Park Service Director's Order 18 requires each park with vegetation capable of burning to prepare a wildland fire management plan to guide a fire management program that responds to the park's natural and cultural resource objectives; provides for safety considerations of park visitors, employees, neighbors, and developed

facilities; and addressees potential impacts to public and private property adjacent to the park. The fire management plan developed for Timpanogos Cave National Monument meets these requirements. The decision to be made is to adopt the plan or not, and the appropriate legal and regulatory compliance commensurate with the action of that decision.

#### National Environmental Policy Act Compliance

A park interdisciplinary team worked with the Zion National Park Fire Management Officer and the Intermountain Region Fire Management Officer in preparation of the Timpanogos Cave National Monument Fire Management Plan. During the final draft of the plan the National Park Service environmental screening form was completed to determine the appropriate process for compliance with the National Environmental Policy Act (NEPA) and other applicable laws and regulations.

The Department of the Interior and the Department of Agriculture jointly published notice of revised procedures for implementing the National Environmental Policy Act and Council on Environmental Quality regulations in the Federal Register on June 5, 2003 (Vol. 68, No. 108, pages 33814 – 33824). The revised procedures were incorporated into DOI Departmental Manual 516, Chapter 2, Appendix 1, which describes Departmental categorical exclusions. Categorical exclusions are categories of actions, which do not individually or cumulatively have a significant effect on the human environment and therefore, normally do not require further analysis in either an environmental assessment or an environmental impact statement. The revision adds two categorical exclusions to Departmental NEPA procedures specifically for hazardous fuels reduction activities, and rehabilitation activities for lands and infrastructure impacted by fire or fire suppression.

Appendix 1, categorical exclusion 1.12 applies for the following actions:

Hazardous fuels reduction activities using prescribed fire not to exceed 4,500 acres, and mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing, not to exceed 1,000 acres. Such activities: Shall be limited to areas (1) in wildland-urban interface and (2) Condition Classes 2 or 3 in Fire Regime Groups I, II, or III outside the wildland-urban interface; Shall be identified through a collaborative framework as described in “A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan;” Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans; Shall not be conducted in wilderness areas or impair suitability of wilderness study areas for preservation as wilderness; Shall not include the use of herbicides or pesticides or the construction of permanent roads or other new permanent infrastructure; and may include the sale of vegetation material if the primary purpose of the activity is hazardous fuels reduction.

In addition to meeting the categorical exclusion, the proposed actions must be evaluated against Departmental exceptions to the use of categorical exclusions (516 DM, 2, appendix 2). If any of the exceptions apply to a proposed action it may not be categorically excluded.

#### Consultation and Coordination

Timpanogos Cave National Monument is surrounded on all sides by the Uinta National Forest. The monument’s limited size of 250 acres makes continual coordination with the Forest necessary to achieve management goals, including fire management. The development of the Timpanogos Cave National Monument Fire Management Plan was done in close coordination with the Uinta National Forest Fire Management Officer and staff, and the Forest’s resource management staff. The proposed Fire Management Plan for the monument is fully compatible

with Forest plans. The monument interdisciplinary team also consulted with the Eastern Great Basin Coordination Fire Center in Salt Lake City to assure the Fire Management Plan is consistent with interagency fire management goals.

Local government coordination was conducted with the Fire Chief of the Alpine-Highland-Cedar Hills Fire District, a three-city organization. These three local communities comprise the communities of concern for urban-wildland interface at Timpanogos Cave National Monument. State Highway 92 passes through the monument as it follows the course of the American Fork River. The monument coordinates with the Utah Department of Transportation (UDOT) Regional Engineer's Office on a frequent basis. The UDOT routinely conducts mechanical thinning along the highway corridor in American Fork Canyon.

During consultation and coordination on the development of the Timpanogos Cave National Monument Fire Management Plan, no person, organization, or government representative had an issue of concern on the plan.

#### Consideration of Proposed Action

In close consultation with the interdisciplinary team, and in review of all associated environmental information on the proposal, I have considered the following facts and information in my decision-making process.

The Timpanogos Cave National Monument Fire Management Plan proposes full suppression of all wildland fires in the monument. Prescribed fire would not be used to manage fuels or to achieve resource management goals. Because the terrain in the monument is very steep and rugged there is little or no opportunity to use heavy ground-disturbing equipment during fire suppression. The steep terrain limits areas where fire fighting ground crews could safely operate. Ground crew suppression actions are primarily possible around facilities in the canyon bottom. The majority of the monument would depend on aerial fire suppression techniques.

The plan proposes mechanical methods to manage fuels. Mechanical fuel reduction has been conducted around monument structures to provide defensible space. Periodic mechanical fuels management would be conducted to maintain that defensible space and in any other areas of high public use that could pose a fire risk. Mechanical fuels reduction has been and would continue to be conducted only by certified crews using hand-held tools. The plan proposes that fuels cut during reduction activities be removed from the monument for disposal. No pile burning of fuels would be conducted in the monument. No herbicides would be used to manage or reduce hazardous fire fuels. All mechanical fuels management activities would be conducted in a manner that achieves the greatest protection of natural and cultural resources possible.

The monument has one Fremont Period pictograph, but no archeological sites, and a small historic district. Implementation of the plan would not affect these resources. Under the plan the State Historic Preservation Officer would be consulted if fire-fighting actions required the use of ground crews or heavy equipment that could disturb monument lands.

There is no historic record of fire within the monument boundary. Records indicate fires in the surrounding national forest were mainly started by lightening strikes and occasionally by human actions, primarily misuse of campfires or escaped burns on private property. During high fire danger the superintendent has authority to close the monument to use of fire and smoking. This authority has been used in recent years in full coordination with federal and state interagency fire programs. Closures will be used under the proposed plan during periods of high fire danger.

## Appendix K - Environmental Screening Form

Because the plan proposes full fire suppression in the monument with limited mechanical fuels reduction, and the monument is 250 acres, the proposed actions of the Timpanogos Cave National Monument Fire Management Plan meet the terms of the Department of the Interior categorical exclusion cited above (516 DM, 2, appendix 1, 1.12). Review of Departmental exceptions to categorical exclusions (516 DM, 2, appendix 2) clearly shows that no exceptions apply to the proposed plan. Not sensitive or controversial issues were identified by the interdisciplinary team or during consultation and coordination.

The proposed plan would be effective for ten years and requires annual review to consider the effectiveness of the plan and updating as needed. Annual plan review provides opportunity to review the accuracy of expected environmental impacts from implementation of the plan, and the appropriateness of this decision.

### Decision

Based upon my review of all environmental impact information in the statutory compliance file, and based upon the above information and considerations, I categorically exclude approval and implementation of the Timpanogos Cave National Monument Fire Management Plan from further analysis under the National Environmental Policy Act.

The Timpanogos Cave National Monument Fire Management Plan will be in effect and implemented upon the date of its signature approval.

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Kit T. Mullen  
Superintendent  
Timpanogos Cave National Monument

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Date